TUGAS AKHIR (MO 141326)

ANALISA *ABANDONMENT AND RECOVERY* SEBAGAI MITIGASI CUACA BURUK PADA PROSES INSTALASI PIPA BAWAH LAUT

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FINAL PROJECT (MO141326)

ABANDONMENT AND RECOVERY ANALYSIS AS A MITIGATION OF INADEQUATE WEATHER OF SUBSEA PIPELINE INSTALLATION PROCESS

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TUGAS AKHIR

Diajukan untuk Memenuhi Salah Satu Syarat Memperoleh Gelar Sarjana Teknik
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ANALISA *ABANDONMENT AND RECOVERY* SEBAGAI MITIGASI CUACA BURUK PADA PROSES INSTALASI PIPA BAWAH LAUT

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ABSTRAK

Proses instalasi pipa bawah laut tidak selamanya berjalan dengan baik. Cuaca yang buruk dapat menyebabkan kerusakan pada saat instalasi oleh karena itu dibutuhkan mitigasi untuk mencegah hal tersebut. Proses *abandonment and recovery* memungkinkan penghentian instalasi untuk sementara waktu dengan menurunkan atau menaikkan pipa dari dasar laut dengan bantuan *winch*. Dengan bantuan OFFPIPE proses *abandonment and recovery* dapat dimodelkan, hasil yang akan diperoleh adalah berupa tegangan ekivalen. Tegangan ekivalen (von Mises) akan menjadi tolak ukur apakah proses *abandonment and recovery* aman dilakukan. Analisa ini dilakukan pada 3 kedalaman berbeda, yaitu: 6.75 m, 13.05 m, dan 19.35 m dengan 3 panjang kabel, yaitu: 120 m, 150 m, dan 180 m yang mewakili seluruh proses *abandonment and recovery*. Dari hasil analisa *abandonment and recovery* dapat diketahui bahwa tegangan paling besar dihasilkan pada bagian *sagbend* pipa, yaitu sebesar 252.01 MPa atau setara dengan 70.20% *specific maximum yield strength* (SMYS) pipa yang digunakan (359 MPa) untuk arah pembebanan gelombang dan arus pada 90^0 dan pada kedalaman 6.75m. Dari hasil ini dapat diketahui bahwa *abandonment and recovery* tidak melebihi batas tegangan yang dijinkan pada saat *abandonment and recovery* yaitu 87% SMYS.

Abandonment and recovery; *Specific maximum yield strength*; Tegangan Ekivalen

ABANDONMENT AND RECOVERY ANALYSIS AS A MITIGATION OF INADEQUATE WEATHER OF SUBSEA PIPELINE INSTALLATION PROCESS

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ABSTRACT

Subsea pipeline installation does not always go well. Bad weather can cause damage during installation, because of that mitigation needed in case of emergency. Abandonment and recovery process allows the installation of temporary cessation with lower or raise the pipe from the bottom of the sea using steel wire and winch. By using OFFPIPE, abandonment and recovery process can be modeled, the results obtained is in the form of equivalent stress. Equivalent stress (von Mises) will become the benchmark whether abandonment and recovery process safely performed. This analysis is done at 3 different depths of 6.75m, 13.05m, and 19.35m and using 3 cable length of 120m, 150m, and 180m representing all abandonment and recovery process. From the analysis of abandonment and recovery can be seen that the highest stress is generated at the sagbend region of the pipe and it is equal to 252.01 MPa, equivalent to 70.20% specific maximum yield strength (SMYS) of the pipe that used in the installation (359 MPa) with direction of wave and current loading on 90^0 and on 6.75m depth. From these results it can be seen that the abandonment and recovery does not exceed the permissible stress of abandonment and recovery that is 87% of linepipe SMYS.

Abandonment and recovery; Equivalent stress; Specific maximum yield strength

KATA PENGANTAR

Puji Syukur Kehadiran Tuhan yang Maha Esa atas berkat dan karunia-Nya sehingga penulis dapat menyelesaikan Tugas Akhir ini sesuai dengan kehendak-Nya. Tugas Akhir ini diberi judul **"Analisa *Abandonment and Recovery* sebagai Mitigasi Cuaca Buruk pada Proses Instalasi Pipa Bawah Laut"**.

Tugas Akhir ini disusun untuk memenuhi salah satu persyaratan dalam menyelesaikan program pendidikan S-1 Jurusan Teknik Kelautan, Fakultas Teknologi Kelautan, Institut Teknologi Sepuluh Nopember Surabaya (ITS).

Penulis berharap Tugas Akhir ini dapat membantu mahasiswa lainnya dalam pengerjaan Tugas Akhir dengan tema yang sama maupun pengembangan teknologi dibidang kelautan. Penulis sadar bahwa penulisan Tugas Akhir ini masih jauh dari kesempurnaan oleh karena itu kritik dan saran yang bertujuan membangun sangat diharapkan.

Surabaya, 4 Januari 2016

Maryanto Satrio

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BAB I
PENDAHULUAN

1.1 Latar Belakang

Dalam dunia *offshore oil and gas*, transportasi hasil produksi memegang peranan yang penting. Salah satu cara transportasi produksi yang paling sering digunakan adalah penggunaan jalur pipa bawah laut atau kerap kali disebut *pipeline* (*offshore pipeline*). *Pipeline* mentrasfer hasil produksi yang berupa fluida bertekanan tinggi seperti minyak, gas, atau air untuk jarak yang sangat jauh, tidak heran jika *pipeline* dapat terbentang hingga ratusan kilometer.

Pipeline dalam perencanaannya juga merencanakan proses instalasinya. Perencanaan proses instalasi pipa bawah laut merencanakan agar tegangan-tegangan yang bekerja pipeline tidak melebihi batas yang telah diatur untuk mencegah kerusakan pada pipa. Untuk mencegah tegangan-tegangan tersebut melampaui batas yang diijinkan, maka hal-hal yang dilakukan adalah mengatur kurvatur *stinger* sebagai tumpuan pada saat melakukan instalasi (Guo, 2005).

Instalasi tidak selamanya berjalan sesuai dengan yang direncanakan. Proses instalasi dapat mengalami gangguan-ganguan, seperti kondisi lingkungan yang tidak memungkinkan untuk melanjutkan proses instalasi. Batas cuaca pelaksanaan instalasi bawah laut harus diketahui. Adapun batas-batas pelaksanaan instalasi itu harus berdasarkan tegangan dan regangan *pipeline*. Jika keadaaan lingkungan telah melewati batas-batas pelaksanaan instalasi, maka akan dilaksanakan proses *abandonment and recovery*. Oleh karena itu, sangat penting untuk melakukan perkiraan cuaca yang memadahi setiap hari untuk membantu merencanakan waktu melaksanakan proses *abandonment and recovery* (GL Noble Denton, 2013). *Abandonment and recovery* adalah dua proses berbeda. *Abandonment* berarti meninggalkan pipa untuk sementara dan akan dilanjutkan proses instalasinya jika keadaan memungkinkan. Proses *abandonment* dimulai dengan memasang tudung (*cap/pullhead*) yang dilas pada ujung pipa yang akan

ditinggalkan, hal ini dilakukan untuk mencegah pipeline kemasukan air laut. Setelah itu, *cap/pullhead* dikaitkan dengan *winch cable* yang terhubung dengan *winch* yang akan mengatur laju dan tegangan pada saat penurunan pipa. Sedangkan *recovery* adalah proses yang merupakan kebalikan dari *abandonment* (Soegiono, 2007).

1.2 Perumusan Masalah

Berikut ini adalah masalah-masalah yang akan dibahas dalam tugas akhir ini:

1. Bagaimanakah tegangan pipa diatas *barge*?
2. Bagaimanakah tegangan yang terjadi pada *pipeline* selama proses *abandonment and recovery*?

1.3 Tujuan

Adapun tujuan penulisan tugas akhir ini adalah:

1. Menghitung tegangan pipa diatas barge.
2. Menghitung tegangan yang terjadi pada pipeline selama proses *abandonment and recovery*.

1.4 Manfaat

Tugas akhir ini diharapkan dapat membantu dalam perencanaan instalasi pipa bawah laut, khususnya perencanaan *abandonment and recovery*. Tugas akhir ini juga diharapkan dapat membantu dalam pengerjaan tugas akhir dengan tema serupa.

1.5 Batasan Masalah

Untuk memudahkan proses pengerjaan tugas akhir ini, maka dalam penyeselesaiannya diberikan batasan-batasan sebagai berikut:

1. Data yang digunakan adalah data *pipeline* 16" di Selat Madura dengan material API 5L grade X52.
2. Kedalaman yang digunakan dalam analisa *abandonment and recovery* ini adalah 6.75 m, 13.05 m, dan 19.35 m dengan *slope* 0^0.

3. Gerakan *barge* yang dianalisa adalah *heave*, *roll*, dan *pitch*.
4. Metode instalasi yang digunakan adalah metode S-lay.
5. *Encountering waves* yang dianalisa adalah dari arah 0^0, 45^0, 90^0, 135^0, dan 180^0.
6. Panjang kabel yang digunakan dalam analisa adalah 120 m, 150 m, dan 180 m.
7. Massa kabel *winch* yang digunakan diabaikan
8. Beban angin diabaikan.
9. Massa *stinger* diabaikan.
10. Pengaruh panjang *winch cable* yang digunakan terhadap perubahan *touchdown point* tidak dianalisa.
11. *Mooring* diabaikan

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BAB II
TINJAUAN PUSTAKA DAN DASAR TEORI

2.1 Tinjauan Pustaka

Instalasi pipa bawah laut tidak selamanya berjalan sesuai dengan yang direcanakan. Jika keadaan lingkungan memburuk dimana tinggi gelombang bertambah atau arus bertambah cepat, maka dengan keadaan seperti ini dapat menyebabkan kerusakan pada pipa khususnya pada bagian yang tidak tersangga. Bagian tidak tersangga pada proses instalasi bawah laut adalah bagian pipa yang bermulai dari ujung stinger (*stinger tip*) sampai pada *touchdown point*. Untuk mencegah kerusakan pada pipa maka kriteria desain diperlukan. Menurut DNV OS F101 tahun 2013 kriteria kegagalan suatu pipa terjadi apabila tegangan ekivalen yang terjadi melebihi 87% dari *specific minimum yield stress* (SMYS) dari *steel pipe* yang digunakan.

Abandonment and recovery merupakan solusi yang berupa mitigasi dari keadaan diatas, dimana *abandonment and recovery* memungkinkan penghentian sementara proses instalasi yang dapat dilanjutkan kembali pada saat memungkinkan. Proses *abandonment* adalah proses meninggalkan pipa dibawah laut dengan bantuan *winch*, dimana kabel *winch* yang telah tersambung dengan *winch* kemudian diikatkan pada *cap* (ujung pipa yang telah ditutup dan dilas) yang berfungsi untuk mencegah pipa agar tidak kemasukan air selama pipa ditinggalkan. Pengerjaan analisa abandonment berupa urutan yang sistematis untuk melihat tegangan yang terjadi terhadap panjang kawat yang digunakan. Panjang kawat yang digunakan pada analisa divariasikan sebagai fase-fase yang sistematis (contoh penggunaan panjang kabel *winch* 0m untuk fase 1, penggunaan panjang kabel *winch* 100m untuk fase 2, dan seterusnya), hal ini bertujuan sebagai penggambaran proses penurunan pipa dari atas barge ke dasar laut. Analisa *abandonment* dan *recovery* dijadikan satu karena *recovery* merupakan kebalikan dari proses *abandonment* (Soegiono, 2005), dimana fase-fase yang telah dianalisa di proses *abandonment* tinggal dibalik urutannya dari fase terakhir ke fase yang

pertama. Oleh karena itu, analisa ini hanya cukup memodelkan salah satu prosesnya saja.

2.2 Dasar Teori

2.2.1 Metode Instalasi

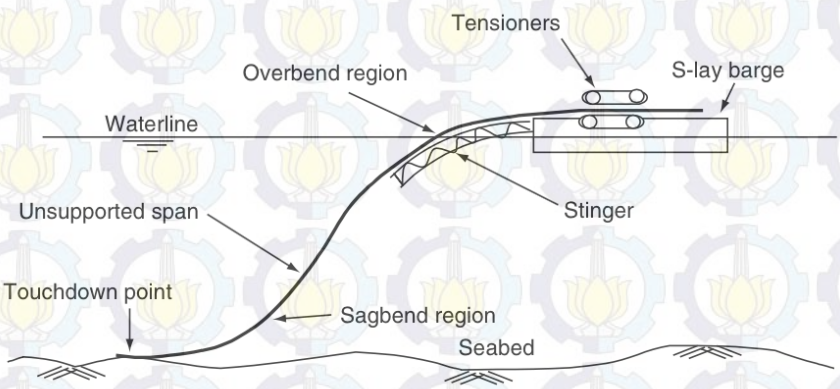
Instalasi pipa bawah laut sangat bergantung pada kedalaman, karena pemilihan metode instalasi yang akan digunakan. Ada beberapa metode instalasi *pipeline* yang sering digunakan, seperti:

1. S-lay (dangkal sampai perairan dalam)
2. J-lay (menegah sampai perairan dalam)
3. Towing (dangkal sampai perairan dalam)
4. Reel lay (menegah sampai perairan dalam)

Adapun perairan dangkal dengan bentang kedalaman dari 0 sampai dengan 500 ft (152.4 m) dibawah permukaan laut. Perairan dengan kedalaman menengah dimulai dari kedalaman 500 ft sampai dengan 1000 ft (304.8 m). Perairan dalam adalah perairan dengan kedalaman lebih dari 1000 ft (Guo, 2005). Berikut ini adalah penjelasan singkat mengenai metode instalasi yang sering digunakan:

a. S-lay

S-lay merupakan metode instalasi yang paling sering digunakan untuk perairan dangkal. Disebut S-lay karena bentuk pipa yang dimulai dari *tensioner* sampai pada *touchdown point* menyerupai bentuk S. Perlengkapan umumnya dimiliki *lay barge* adalah *tensioner* yang berfungsi sebagai penahan pipa agar tidak meluncur ke laut juga sebagai pengontrol penurunan pipa yang telah disambung. Selain *tensioner* perlengkapan utama lainnya adalah *roller* dan *stinger*. *Roller* berfungsi mengantarkan pipa ke laut juga memberi gaya tumpuan buat pipa yang ada diatasnya, sedangkan *stinger* berfungsi mengatur kurvatur (kelengkungan) pipa agar tidak melebihi syarat yang diijinkan.

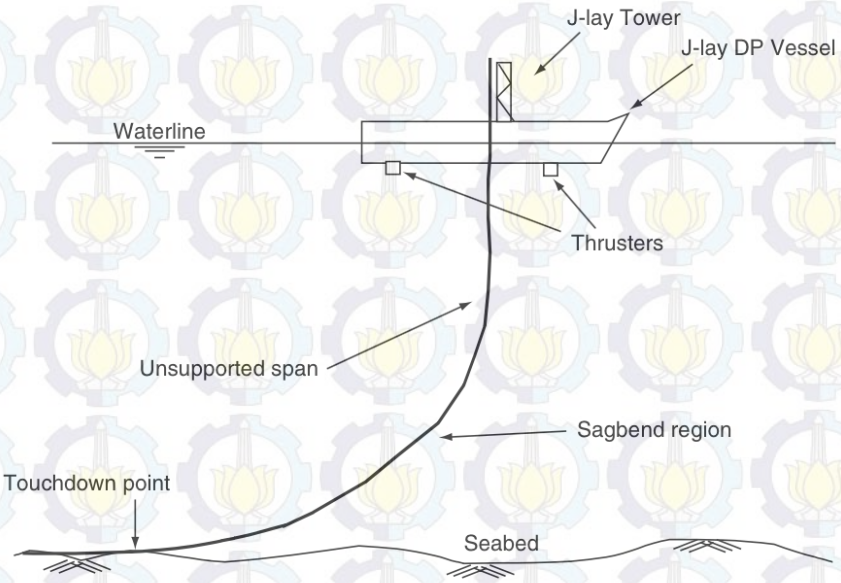


Gambar 2.1 S-lay (Guo, 2005)

S-lay mempunyai dua daerah kritis, yaitu: *overbend region* dan *sagbend region*. *Overbend region* dapat dilihat pada Gambar 2.1 diatas, *overbend region* merupakan daerah yang mengalami pelengkungan sesuai dengan kelengkungan *stinger*. *Sagbend region* merupakan lengkungan pipa di daerah yang mendekati *touchdown point*.

b. J-lay

J-lay adalah proses yang yang digunakan untuk perairan dengan kedalaman yang cukup dalam. J-lay menyambung pipa-pipanya secara vertikal atau hampir vertikal. J-lay hanya memiliki *sagbend region* tanpa adanya *overbend region*.



Gambar 2.2 J‑lay (Guo, 2005)

c. *Reel lay*

Reel lay adalah metode instalasi yang menggunakan alat gulungan besar yang telah berisi pipa yang telah dipasang sewaktu masih di daratan, jadi pengelasan tidak dilakukan diatas struktur terapung.

d. *Towing*

Metode instalasi menggunakan *towing*, menggunakan kapal tunda (*tug boat*) untuk menarik pipa yang dihubungkan dengan *winch cable*. Pipa diberikan *bouyancy* yang sedemikian rupa, sehingga pipa yang ditarik dapat ditentukan kedalaman *towing*nya. *Bouyancy* tambahan yang diberikat berupa sejumlah *floater* yang memberikan *bouyancy* yang dikehendaki.

2.2.2 Tegangan Ekivalen (von Mises *Stress*)

Tegangan von mises adalah kriteria tegangan yang diijinkan. Besarnya tegangan von mises yang diijinkan akan dijelaskan pada sub‑bab berikutnya. Adapun tegangan von mises dijelaskan melalui persamaan 2.1 sampai dengan persamaan 2.5 berikut:

$$\sigma_e \leq \sqrt{\sigma_h^2 + \sigma_l^2 - \sigma_h \sigma_l + 3\tau_{hl}^2} \qquad (2.1)$$

$$\sigma_e \leq \eta \ SMYS \quad (2.2)$$

$$|\sigma_l| \leq \eta \ SMYS \quad (2.3)$$

$$\sigma_h = (p_i - p_e)\frac{D-t}{2t} \quad (2.4)$$

$$\sigma_l = \frac{N}{\pi(D-t)t} + \frac{M}{\frac{\pi(D^4-(D-t)^4)}{32.D}} \quad (2.5)$$

dimana

D = *linepipe outside diameter* (OD), m

N = *pipe wall force*, N

M = *bending moment*, Nm

p_e = *external pressure*, N/m^2

p_i = *internal pressure*, N/m^2

SMYS = *specific minimum yield strength*, N/m^2

t = *linepipe thickness*, m

σ_e = von mises *stress*, N/m^2

σ_h = *hoop stress*, N/m^2

σ_l = *axial stress*, N/m^2

τ_{hl} = *tangential shear stress*, N/m^2

η = *usage factor*

2.2.3 *Allowable Stress and Strain Criteria*

Dalam analisanya baik tegangan maupun regangan harus mengikuti aturan yang telah diatur dalam DNV OS F101 pada wilayah *sagbend* maupun *overbend*. Untuk wilayah *overbend*, regangannya harus mengikuti kriteria I untuk analisa statis dan kriteria II untuk analisa dinamis. Adapun *linepipe* API 5L X52 yang akan digunakan pada analisa ini memiliki kriteria I dan II berturut turut adalah sebesar 0.205% dan 0.260%. Untuk wilayah *sagbend* baik pada saat melakukan analisa statis dan analisa dinamis tegangannya tidak boleh melebihi 87% dari SMYS.

2.2.4 Spektra Pierson-Moskowitz (PM)

Pierson dan Moskowitz (1964) mengajukan suatu formulasi gelombang yang kemudian dikenal sebagai spektra PM. Spektra PM sesuai untuk kondisi

gelombang *fully developed seas*. *Fully developed seas* terjadi jika angin berhembus dangan kecepatan konstan pada jarak bentangan yang panjang dan dalam kurun waktu lama, dimana energi angin terserap seutuhnya oleh permukaan air laut (Djatmiko, 2012). Spektra PM menurut DNV RP C205 dapat diformulasikan dengan persamaan 2.6 dan 2.7 berikut:

$$S_{PM}(\omega) = \frac{5}{16} {H_s}^2 {\omega_P}^2 \omega^{-5} \exp\left(-\frac{5}{4}\left(\frac{\omega}{\omega_P}\right)^{-4}\right) \quad (2.6)$$

$$\omega_P = \frac{2\pi}{T_P} \quad (2.7)$$

dimana:

H_s = *significant wave height*, m

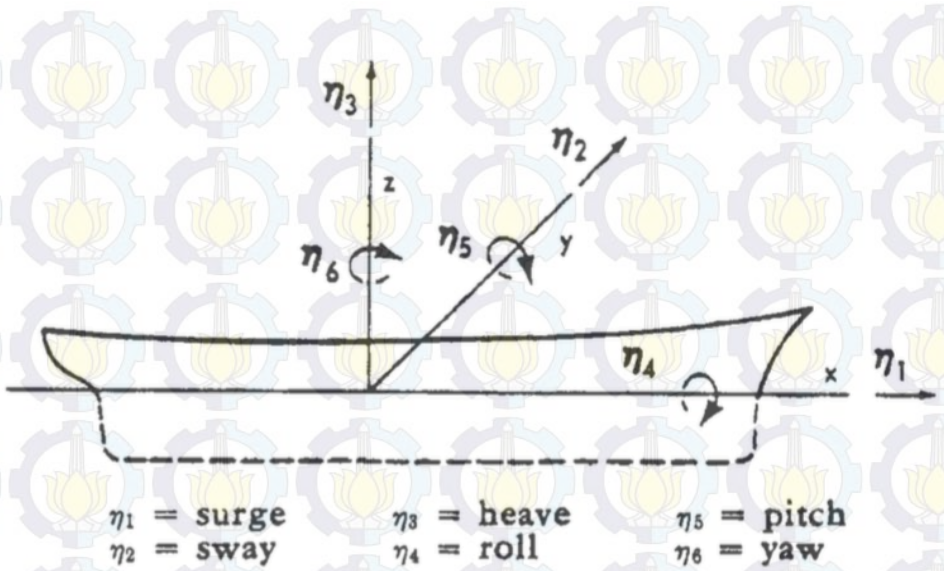
T_P = *peak period*,s

ω_P = *peak frequency*, rad/s

2.2.5 *Response Amplitude Operator* (RAO)

RAO (*Response Amplitude Operator*) atau disebut juga dengan *Transfer function* yang digunakan untuk mengidentifikasi efek gelombang terhadap gerakan *vessel*. RAO umumnya disajikan dengan menggunakan grafik dimana absisnya berupa parameter frekuensi, sedangkan ordinatnya berupa perbandingan amplitudo gerakan tertentu terhadap amplitudo gelombang (Djatmiko, 2012).

Respon gerakan RAO berupa 6 derajat kebebasan untuk masing-masing *encountering waves*. Tiga RAO berupa karakterik gerakan translasional (*surge, sway,* dan *heave*), sedangkan 3 gerakan lainnya berupa gerakan rotasional (*roll, pitch,* dan *yaw*).



Gambar 2.3 6 DoF pada *Vessel* (Chakrabarti, 2005)

2.2.6 *Dynamic Analysis*

Analisa dinamis dibantu program MAXSURF dan OFFPIPE. Analisa dinamis dilakukan untuk *head seas* (180^0), *beam seas* (90^0), *following seas* (0^0), dan *quartering seas* (45^0 dan 135^0). Program MAXSURF digunakan untuk mencari RAO 6 DoF untuk 5 arah datang gelombang diatas, sedangkan program OFFPIPE akan digunakan untuk menganalisa perilaku dinamis *pipelaying barge* terhadap tegangan pada waktu instalasi.

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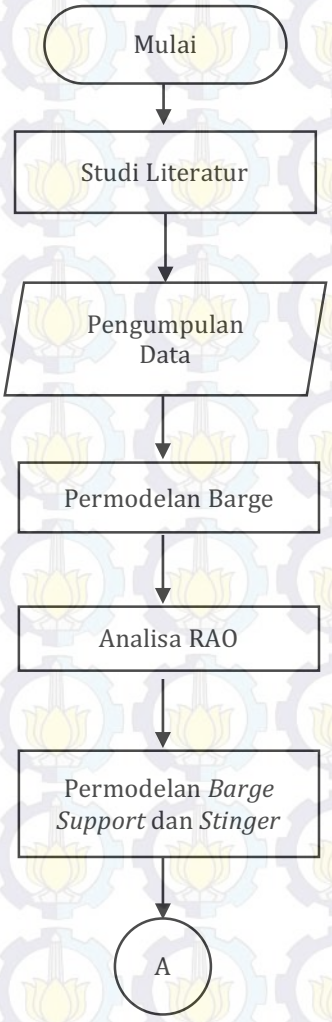
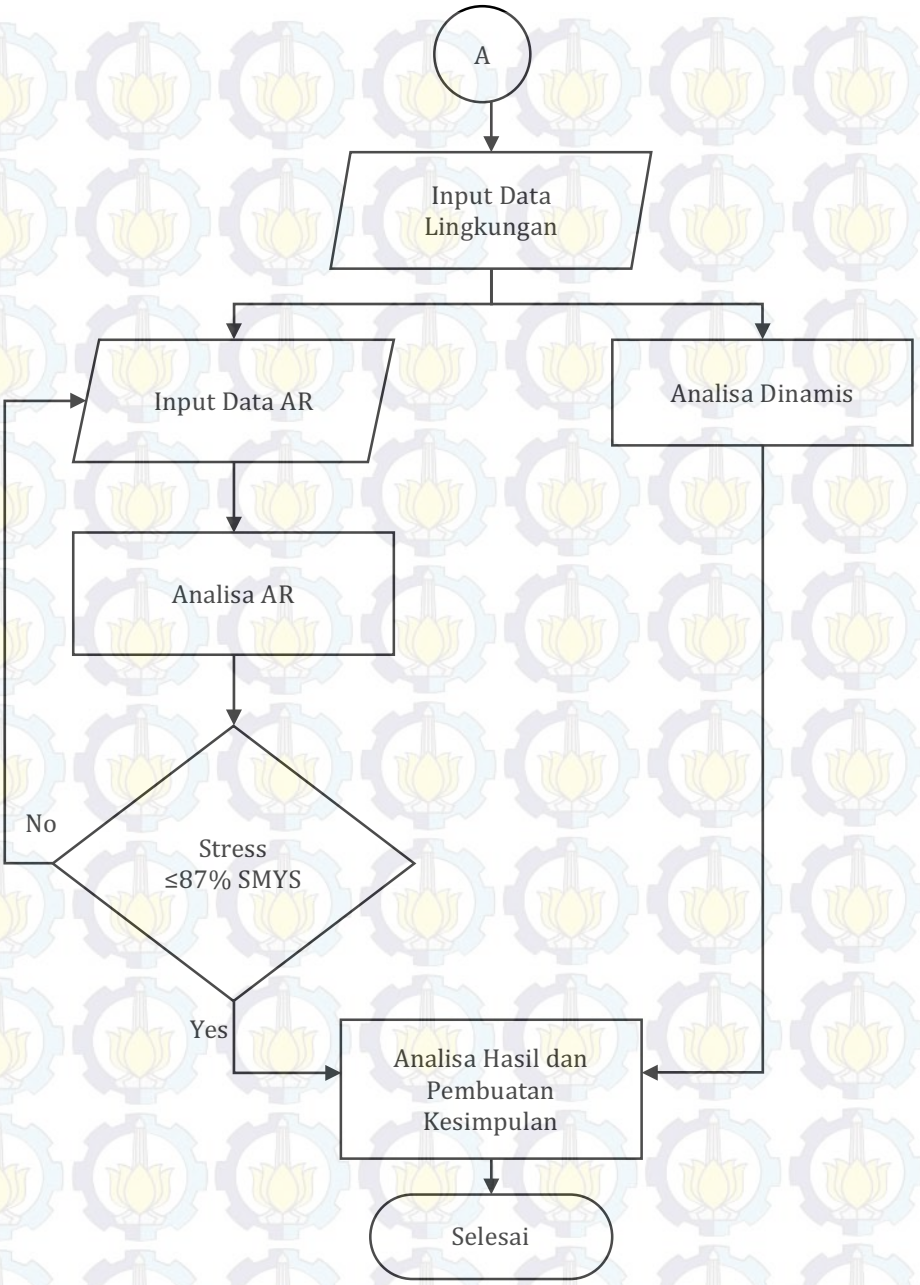
BAB III
METODOLOGI PENELITIAN

3.1 Metode Penelitian

Pengerjaan tugas akhir ini memerlukan tahapan-tahapan yang sistematis dalam pengerjaannya. Adapun tahapan-tahapan yang ditempuh dalam pengerjaan tugas akhir ini mengikuti diagram alur pada Gambar 3.1.





Gambar 3.1 Diagram Alir

3.2 Prosedur Penelitian

Berikut ini adalah langkah-langkah penelitian, yang menjelaskan diagram alir diatas:

1. Studi literatur mengenai hal-hal yang dapat membantu proses pengerjaan tugas akhir.
2. Pengumpulan data yang diperlukan dalam penelitian yang akan dilakukan.

3. Pembuatan model menggunakan *Maxsurf Modeller* dan *Maxsurf Motion* untuk menentukan RAO *barge* yang digunakan.
4. Pembuatan model *barge support* dan *stinger* pada OFFPIPE
5. Input data lingkungan dan analisa dinamis untuk mengetahui pengaruh gelombang dan arus terhadapa proses instalasi pipa bawah laut.
6. Input data *abandonment and recovery* (AR) dan analisa dinamis proses *abandonment and recovery*.
7. Pengecekan tegangan yang terjadi selama proses *abandonment and recovery* dan melalakukan permodelan ulang jika tegangan melebihi tegangan yang diijinkan.
8. Penarikan kesimpulan dari hasil-hasil analisa yang telah diperoleh.

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BAB IV
ANALISA DAN PEMBAHASAN

4.1 Analisa Data

Dalam pengerjaan tugas akhir ini diperlukan data-data yang menunjang pengerjaannya. Data-data tersebut adalah data pipa yang akan diinstal, data *barge*, dan data lingkungan. Adapun data-data yang digunakan tersebut dapat dilihat pada Tabel 4.1 sampai dengan Tabel 4.3 berikut ini:

Tabel 4.1 *Linepipe properties*

Parameter		**Units**
Line Pipe OD	406.4 (16")	mm
Selected Thickness	12.7 (0.5")	mm
Material	API 5L Grade X52	-
Line Pipe SMYS	359	MPa
Modulus Young	$2.07x10^5$	MPa
Poisson Ratio	0.3	-
Steel Density	7850 (77009)	Kg/m^3 (N/m^3)
Corrosion Coating (CC)	*Asphalt Enamel*	-
CC Density	1300 (12753)	Kg/m^3 (N/m^3)
CC Thickness	5.5	mm
Concrete Coating (CWC) Density	3044 (29862)	Kg/m^3 (N/m^3)
CWC Thickness	25.4	mm

Tabel 4.2 *Barge properties*

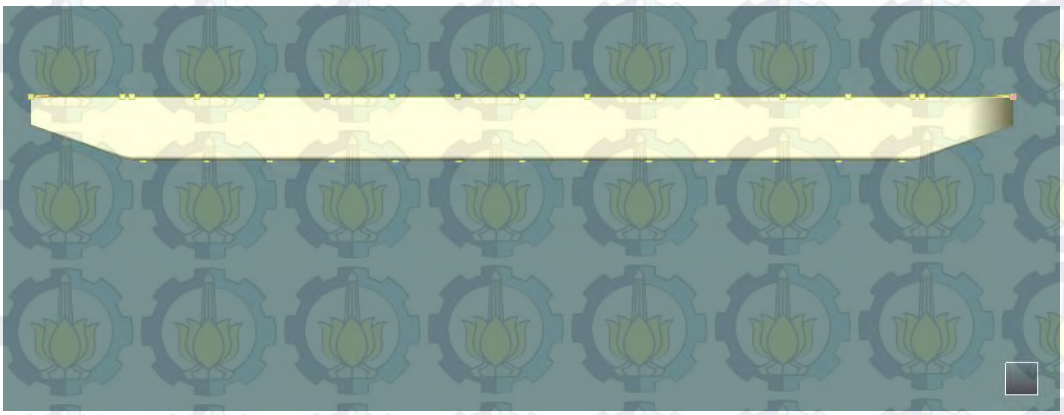
Parameter	***Units* (m)**
Length of All	86
Breadth	27.5
Depth	5.5
Draft	1.8

Tabel 4.3 Data lingkungan

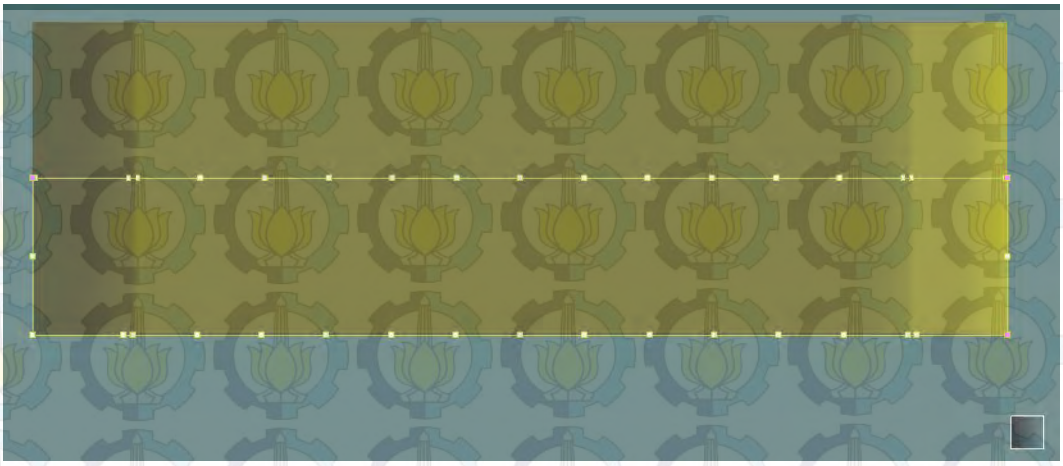
Return period (years)	H_s *(m)*	T_p *(s)*	ω_p *(rad/s)*	*Current Speed (m/s)*		
				0% Depth	*50% Depth*	*100% Depth*
100	4.60	9.7	0.65	1.40	1.07	0.73
10	3.60	8.8	0.71	1.28	1.01	0.70
1	2.62	7.7	0.82	1.07	0.82	0.58

4.2 Permodelan *Barge* dan *Response Amplitude Operator* (RAO)

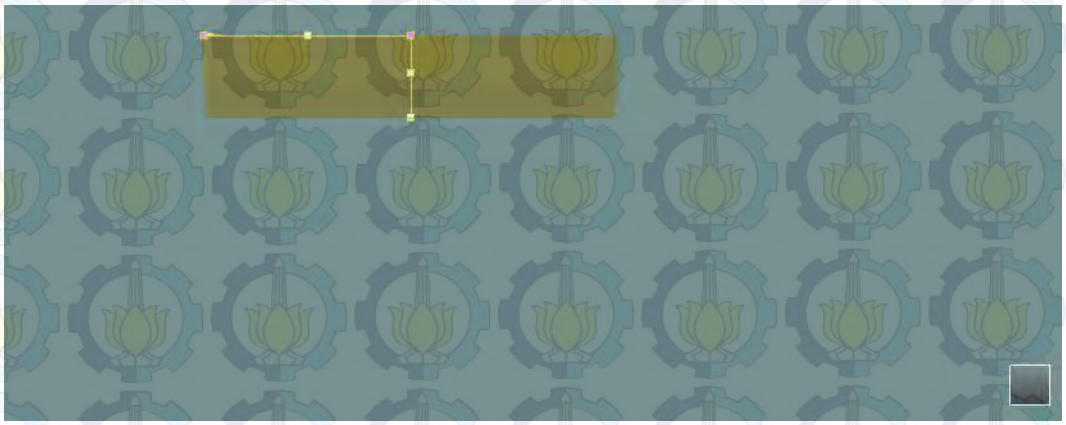
Analisa dinamis yang akan dilakukan membutuhkan RAO sebagai informasi tentang karakteristik gerakan dan untuk menentukan RAO dibutuhkan model komputer barge yang akan digunakan untuk proses *abandonment and recovery*. *Barge* yang akan digunakan pada analisa ini adalah Kalinda dengan kapasitas *tensioner* dan *winch* sama-sama 30 ton atau setara dengan 294.3 kN. Kalinda memiliki *length of all* 86 m dengan *breadth* 27.5 m. *Draft barge* yang digunakan adalah 1.8 m. Pembuatan model komputer dilakukan dengan bantuan *Maxsurf Modeller*. Adapun model yang dibuat dapat dilihat pada Gambar 4.1 sampai dengan 4.4 dibawah ini:



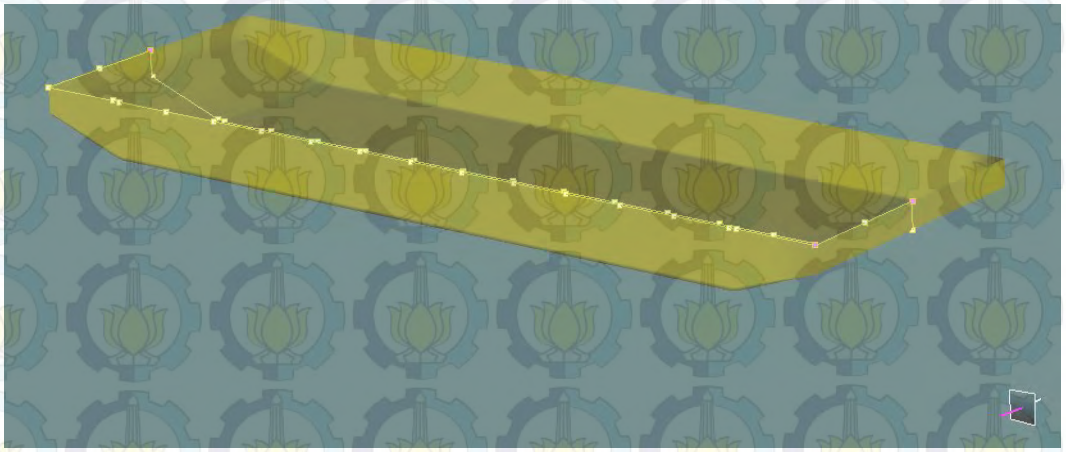
Gambar 4.1 *Barge* model tampak samping



Gambar 4.2 *Barge* model tampak bawah



Gambar 4.3 *Barge* model tampak depan.



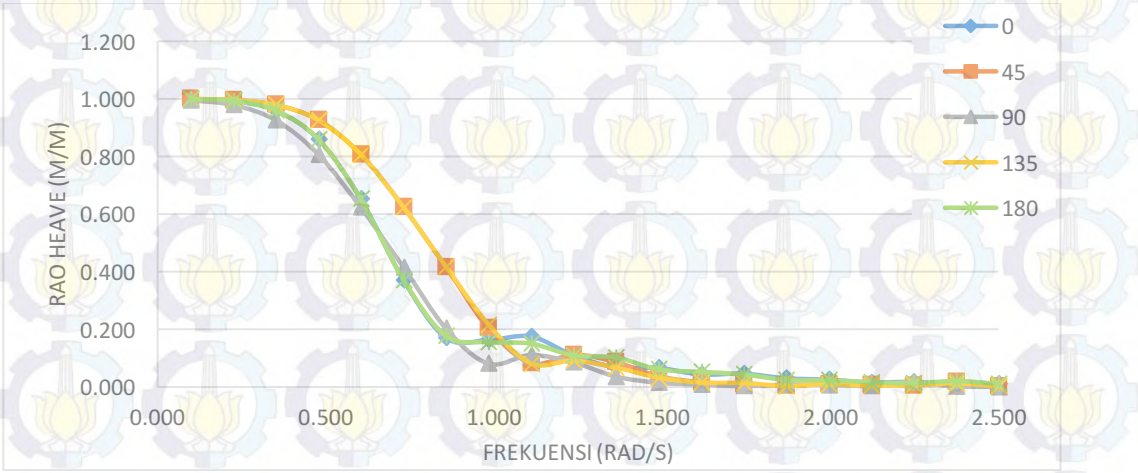
Gambar 4.4 *Barge* model tampak isometrik.

Model yang telah dibuat kemudian akan dibandingkan divalidasi terhadap parameter-parameter *barge* yang sebenarnya. Validasi model yang dilakukan dapat dilihat pada Tabel 4.4 dibawah ini.

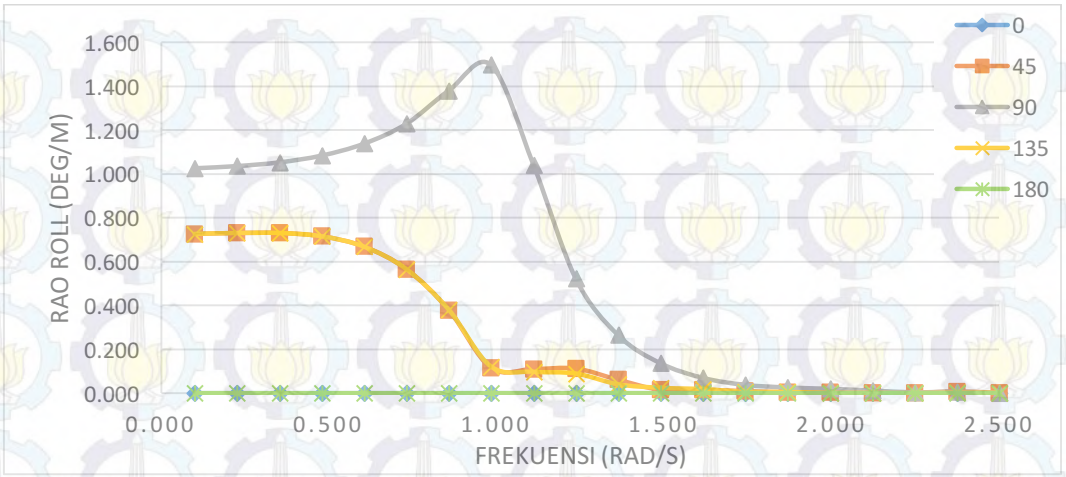
Tabel 4.4 Validasi barge Kalinda

Parameter	***Booklet***	**Model**	***Error* (%)**
Displacement (ton)	3587	3619	0.89
KB (m)	9.35	9.25	1.07

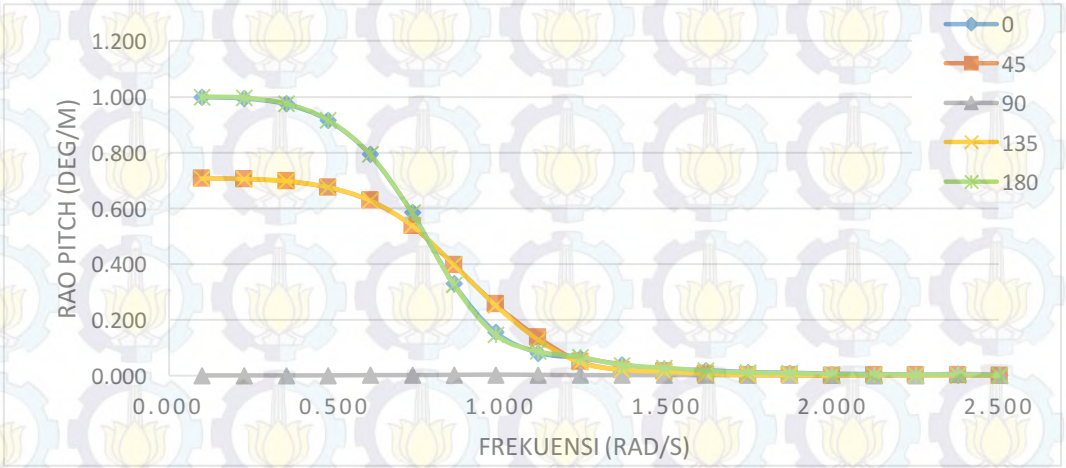
Dengan menggunakan model komputer yang ditunjukkan oleh Gambar 4.1 sampai dengan Gambar 4.4. diatas, maka akan dihasilkan RAO untuk 3 gerakan yang dianalisa, yaitu: *heave*, *pitch*, dan *roll*. Analisa RAO yang dilakukan dengan 5 arah pembebabanan masing-masing 0^0, 45^0, 90^0, 135^0, dan 180^0. Dengan menggunakan *Maxsurf Motion*, adapun hasil RAO untuk gerakan *barge* dapat dilihat pada Gambar 4.5 sampai dangan 4.7 dibawah ini.



Gambar 4.5 RAO *heave*



Gambar 4.6 RAO *roll*



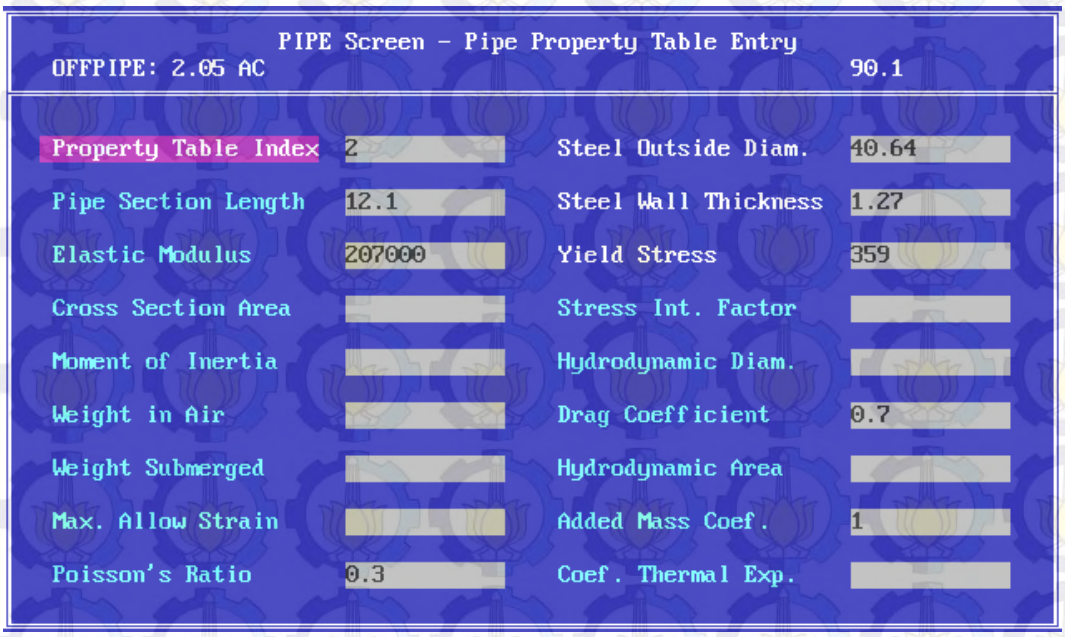
Gambar 4.7 RAO *pitch*

Dari Gambar 4.5 dapat dilihat bahwa RAO *heave* hampir sama untuk semua arah gelombang dengan nilai maksimum 1 m/m pada frekuensi terendah yang digunakan yaitu 1 rad/s. Untuk RAO *roll* pada Gambar 4.6 diatas dapat diketahui bahwa arah gelombang 90^0 menghasilkan RAO *roll* tertinggi dengan RAO *roll* 1.49 deg/m pada frekuensi 0.98 rad/s dan disusul oleh arah gelombang 45^0 dan 135^0 masing-masing dengan RAO *roll* sebesar 0.73 deg/m pada dua frekuensi yang sama 0.23 rad/s dan 0.35 rad/s. Untuk RAO *pitch* pada Gambar 4.7, nilai RAO untuk gelombang dengan arah pembebanan 0^0 dan 180^0 menghasilkan RAO terbesar dengan 1.0 deg/m pada frekuensi 0.1 rad/s disusul

oleh arah gelombang 45^0 dan 135^0 dengan nilai 0.71 deg/m pada frekuensi 0.1 rad/s.

4.3 Input Model OFFPIPE

Input data pada OFFPIPE dimulai dengan input properti pipa yang akan dipasang sepanjang jalur instalasi. Data pipa yang digunakan terdapat pada Tabel 4.1 mengenai properti pipa yang akan dipasang. Form input pipa dapat dilihat pada Gambar 4.8 dan 4.9 dibawah ini. Nilai-nilai yang dimasukkan sesuai dengan data properti pipa yang digunakan untuk rasio poisson menggunakan rasio poisson baja sebesar 0.3 untuk koefisien drag dan *added mass* menggunakan nilai 0.7 dan 1 sesuai dengan DNV RP E305.

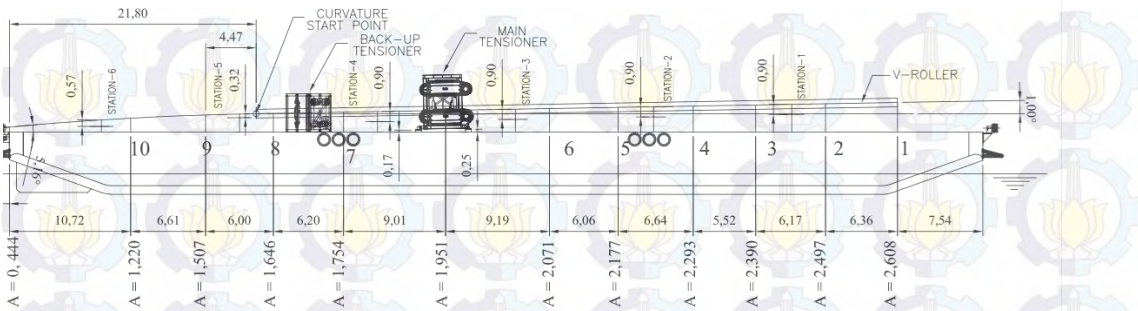


Gambar 4.8 Input properti pipa

Gambar 4.9 Input properti *coating* pada pipa

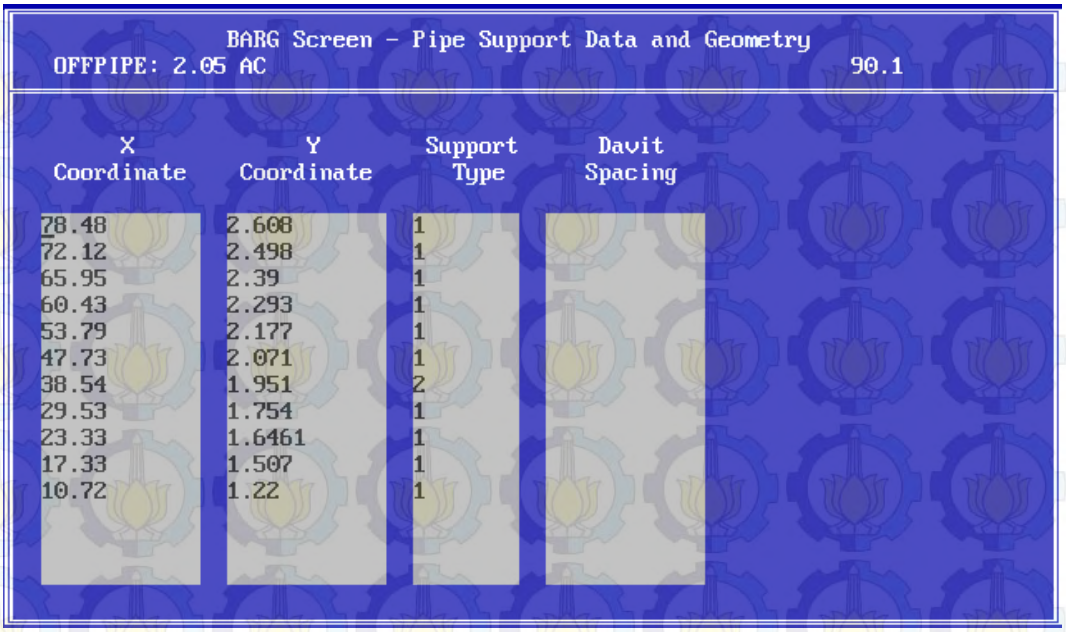
Input *support* pada barge mengikuti konfigurasi *support* dengan inputan berupa jarak *deck* terhadap *bottom of pipe* (BOP). Adapun konfigurasi *support* pada *barge* Kalinda yang digunakan dapat dilihat pada Gambar 4.10 dibawah ini. Nilai A pada Gambar 4.10 dibawah memiliki satuan meter yang menyatakan ketinggian *support* terhadap *deck* yang selanjutkan akan digunakan sebagai koordinat Y pada inputan data. Inputan X untuk data *support* pada *barge* dengan titik 0 ada pada *bow* dengan arah ke kanan bernilai positif dan sebaliknya. Adapun inputan X dan Y yang dilakukan dapat dilihat pada Gambar 4.12.

Support pada *barge* dapat berupa *roller* atau *tensioner*. *Roller* berfungsi sebagai tunmpuan pada pipa dan memudahkan gerakan pipa menuju atau meninggalkan *barge*, sedangkan tensioner berfungsi untuk sebagai penggerak utama pipa dengan cara menjepit pipa kemudian menggerakkan menuju atau meninggalkan *barge*. Pada inputan yang dilakukan pada OFFPIPE yang dapat dilihat pada Gambar 4.12 terdapat *support type*, pada hal ini 1 berarti *roller* dan 2 berarti *tensioner*. Adapun inputan penting lain yang dilakukan adalah tinggi *deck* diatas air. Adapun tinggi *deck* diatas air adalah 3.7 m dengan *draft* yang digunakan adalah 1.8 m sebagai *draft* yang dianjurkan pada instalasi ini.



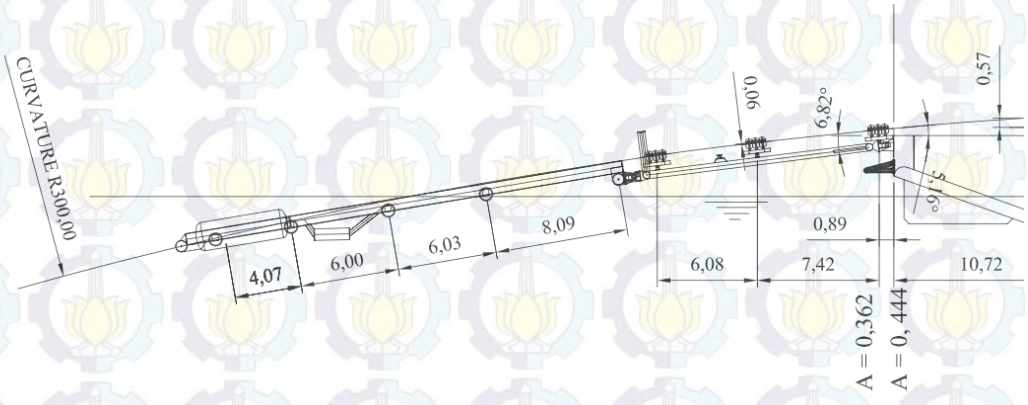
Gambar 4.10 Konfigurasi *barge support* pada Kalinda

Gambar 4.11 Input data Barge

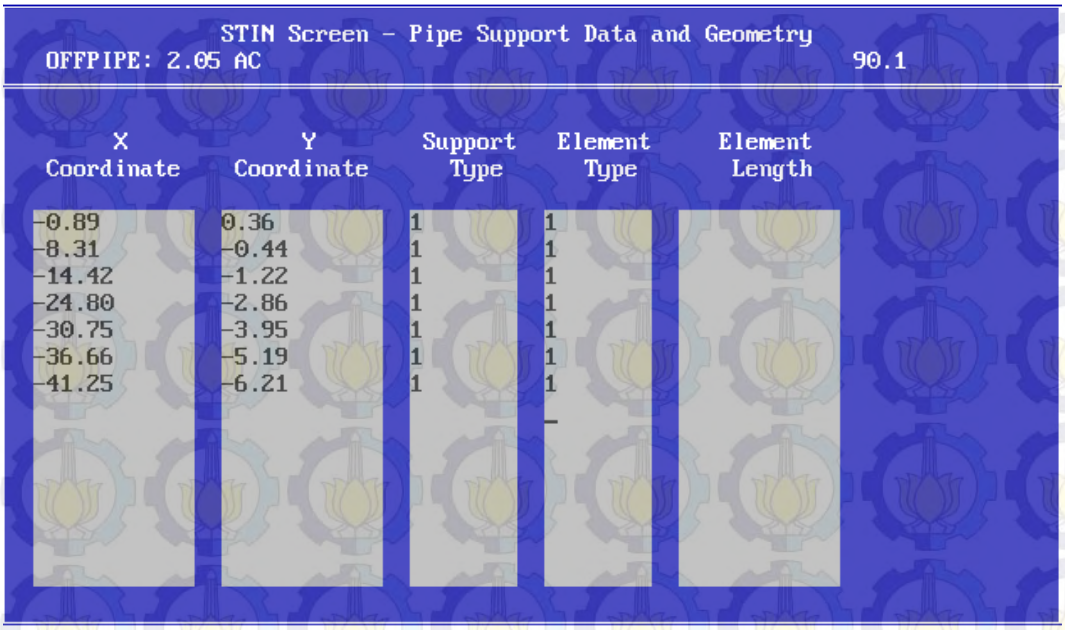


Gambar 4.12 Input *support* pada *barge*

Inputan lainnya yang dilakukan adalah input model *stinger*. Dengan menggunakan konfigurasi seperti pada Gambar 4.13 dibawah ini, maka inputan *stinger* kedalam OFFPIPE dilakukan seperti pada Gambar 4.14 dibawah ini. *Support type* yang digunakan pada instalasi ini adalah *simple support* dengan menggunakan kode 1, sedangkan *element type* yang digunakan menggunakan kode 1 untuk *fixed element*.



Gambar 4.13 Konfigurasi *stinger* yang digunakan

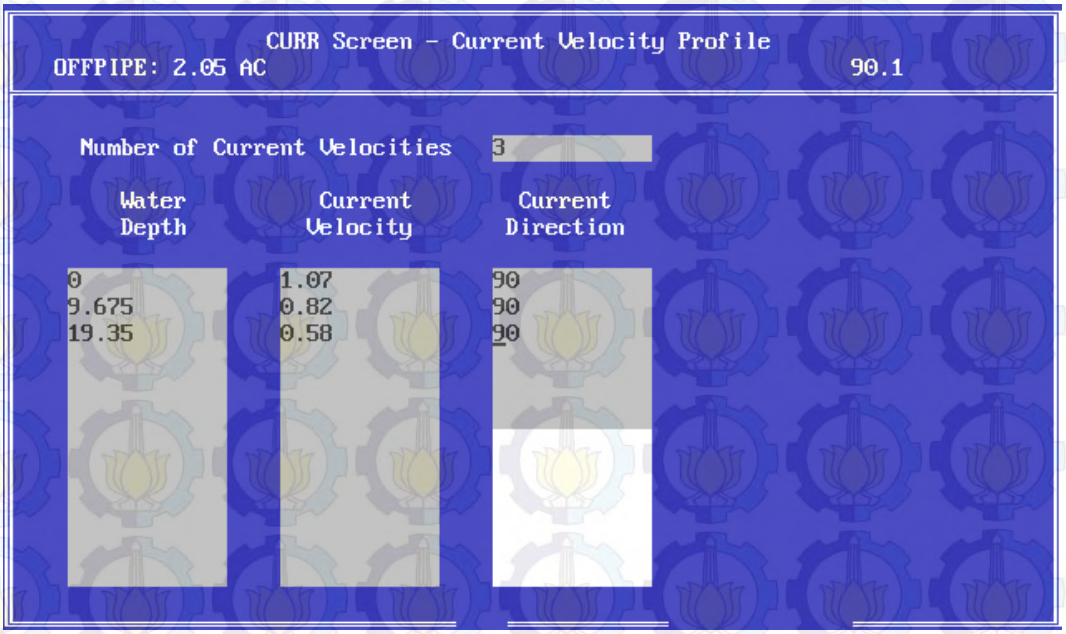


Gambar 4.14 Input model *stinger* pada OFFPIPE

Inputan-inputan yang telah dijelaskan sebelumnya merupakan inputan-inputan model meliputi pipa yang akan diinstal dan inputan model dari barge yang digunakan pada proses instalasi. Selain inputan-inputan yang telah dijelaskan diatas ada juga inputan-inputan yang lain, diantaranya adalah inputan data arus, spektra, RAO, dan input data kabel yang digunakan. Inputan-inputan tersebut dapat dilihat pada Gambar 4.15 sampai dengan Gambar 4.18 berikut ini.

Inputan data arus yang digunakan berbeda-beda sesuai dengan 3 kedalaman yang digunakan. Input data arus yang digunakan menggunakan 3 titik input data arus untuk masing masing kedalaman yang digunakan, yaitu pada permukaan (0% *depth*), pada pertengahan kedalaman (50% *depth*), dan sesaat mendekati dasar laut (diasumsikan 100% *depth*). Data arus yang digunakan adalah data arus 1 tahunan untuk kombinasi cuaca buruk dengan penggunaan data gelombang 10 tahunan (DNV RP F109). Adapun contoh data penginputan yang dilakukan dapat dilihat pada Gambar 4.15 berikut dengan data inputan yang dilakukan dapat dilihat pada Tabel 4.3 tentang data arus. Untuk input data gelombang masing-masing yang dilakukan untuk analisa yang berbeda baik dari

faktor kedalaman maupun arah pembebanan gelombang dapat dilihat pada lampiran *output*.



Gambar 4.15 Contoh input data arus untuk arah pembebanan gelombang 90^0 dengan kedalaman 19.35 m

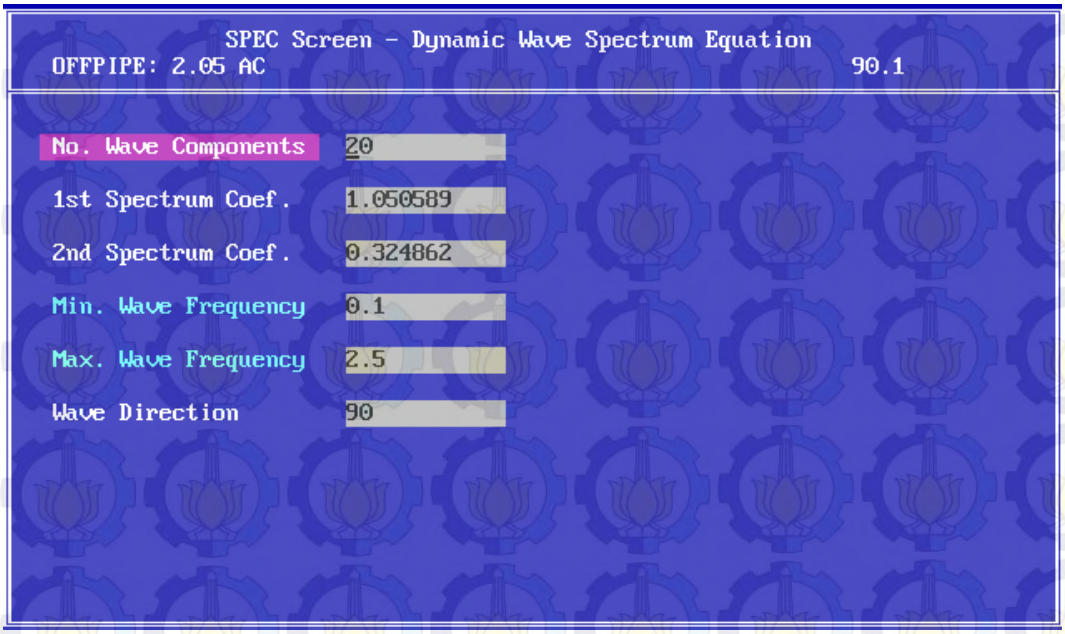
Spektra yang digunakan pada analisa ini adalah spektra Pierson-Moskowitz (PM), yang merupakan anjuran dari data data yang digunakan walaupun daerah utara laut Madura merupakan perairan tertutup (kepulauan). Input data spektra PM (persamaan 2.6) akan ditransformasi menyerupai format inputan OFFPIPE yang ditunjukan oleh persamaan 4.1 dibawah ini. Untuk penggunaan gelombang dengan periode ulang 10 tahunan maka nilai B dan C yang digunakan berturut-turut adalah 1.050589 dan 0.324862.

$$S(\omega) = B\,\omega^{-5} \exp\left(\left(\frac{-C}{\omega}\right)^4\right) \qquad (4.1)$$

dimana:

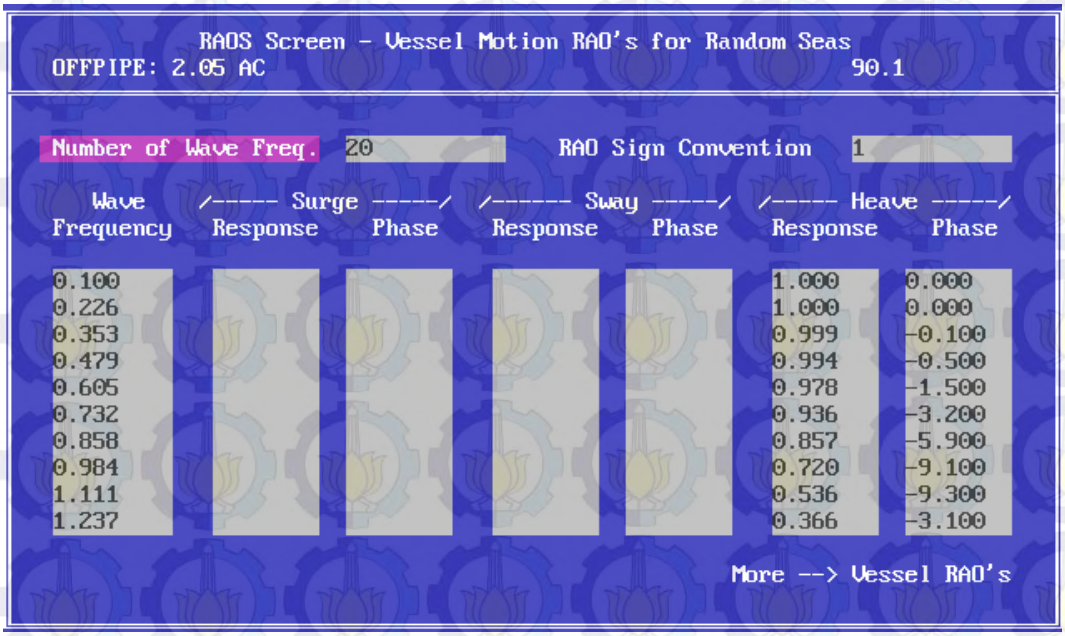
B = 1st *spectrum coefficient* $= \frac{5}{16} H_s{}^2\, \omega_P{}^2$

C = 2nd *spetrum coefficient* $= \frac{5}{4} \omega_P{}^4$

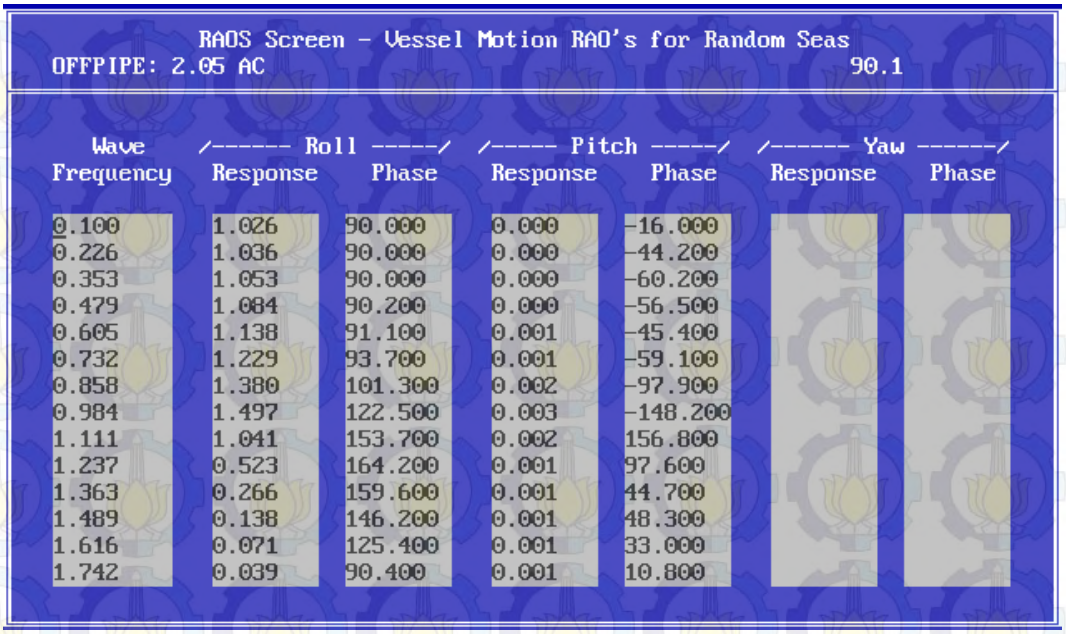


Gambar 4.16 Contoh input data spektra PM untuk arah pembebanan 90^0

Untuk inputan-inputan lainnya yang dilakukan adalah RAO dan panjang kabel yang digunakan ditunjukkan melalui Gambar 4.17 sampai dengan 4.19 berikut ini.



Gambar 4.17 Contoh input RAO translasional untuk arah pembebanan 90^0

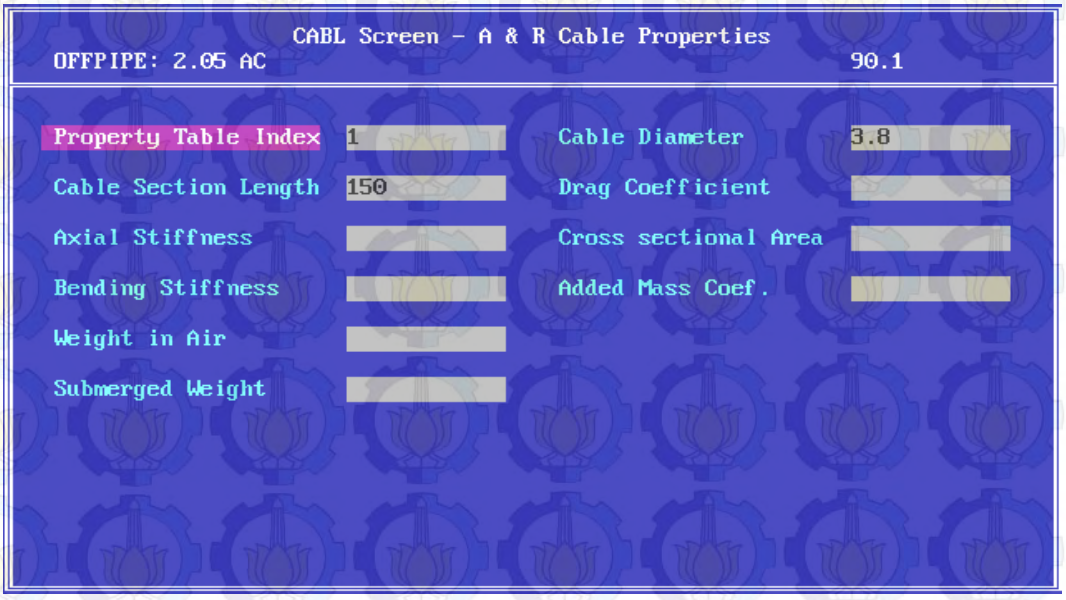


RAOS Screen - Vessel Motion RAO's for Random Seas

OFFPIPE: 2.05 AC 90.1

Wave Frequency	Roll Response	Roll Phase	Pitch Response	Pitch Phase	Yaw Response	Yaw Phase
0.100	1.026	90.000	0.000	-16.000		
0.226	1.036	90.000	0.000	-44.200		
0.353	1.053	90.000	0.000	-60.200		
0.479	1.084	90.200	0.000	-56.500		
0.605	1.138	91.100	0.001	-45.400		
0.732	1.229	93.700	0.001	-59.100		
0.858	1.380	101.300	0.002	-97.900		
0.984	1.497	122.500	0.003	-148.200		
1.111	1.041	153.700	0.002	156.800		
1.237	0.523	164.200	0.001	97.600		
1.363	0.266	159.600	0.001	44.700		
1.489	0.138	146.200	0.001	48.300		
1.616	0.071	125.400	0.001	33.000		
1.742	0.039	90.400	0.001	10.800		

Gambar 4.18 Contoh input RAO rotasional untuk arah pembebanan 90^0



CABL Screen - A & R Cable Properties

OFFPIPE: 2.05 AC 90.1

Property Table Index	1	Cable Diameter	3.8
Cable Section Length	150	Drag Coefficient	
Axial Stiffness		Cross sectional Area	
Bending Stiffness		Added Mass Coef.	
Weight in Air			
Submerged Weight			

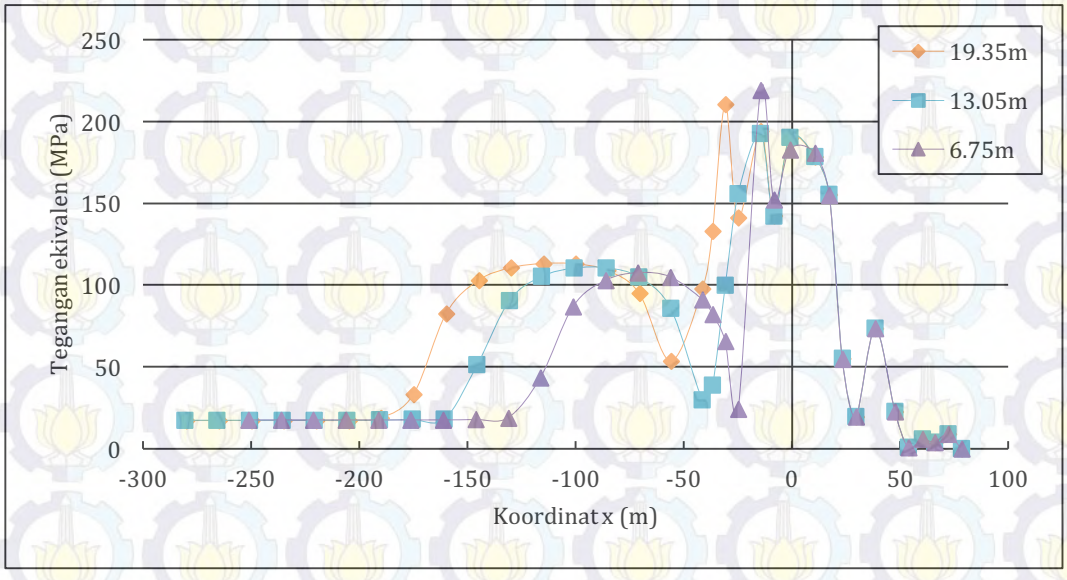
Gambar 4.19 Contoh input panjang kabel *winch* 150 m

Input RAO menggunakan 20 frekuensi dengan rentang 0.1 rad/s sampai dengan 2.5 rad/s untuk gerakan *heave*, *roll*, dan *pitch* sebagai gerakan yang dianggap kritis terhadap instalasi dengan data berupa respon dan *phase* (sudut fase antara permukaan gelombang dengan pusat gravitasi, jika positif berarti respon terjadi sebelum puncak gelombang melalui pusat gravitasi dan sebaliknya).

4.4 Analisa Dinamis

Analisa dinamis dilakukan untuk mengetahui pengaruh gelombang dan arus terhadap pipa ketika masih berada diatas *barge*. Instalasi dilakukan selama 4 bulan, oleh kerena itu menurut DNV RP F109 instalasi selama kurang dari 12 bulan tetapi melebihi 3 hari maka akan menggunakan data gelombang dengan periode ulang 10 tahun dan data arus dengan periode ulang 1 tahun (*temporary condition*). Penggunaan kombinasi data gelombang 100 tahunan dan arus 10 tahunan digunakan untuk *permanent condition* atau *temporary condition* yang melebihi 12 bulan. Analisa dinamis dilakukan dengan bantuan program OFFPIPE dengan output berupa tegangan ekivalen yang terjadi sepanjang pipa (lihat lampiran). Adapun penyederhanaan output yang berupa tegangan ekivalen yang terjadi sepanjang pipa, dijelaskan pada grafik 4.20 sampai dengan grafik 4.24 berikut ini. Nilai x pada grafik yang akan dijelaskan merupakan jarak terhadap *bow* dimana lokasi yang berada di sebelah kanan nilai 0 bernilai positif dan disebelah kiri nilai 0 bernilai negatif. Beberapa nilai x yang penting adalah x=38.54 m yang merupakan *tensioner* dan x=-41.25 m yang merupakan ujung *stinger* yang merupakan tumpuan terakhir pipa pada *barge*.

a. Analisa tegangan ekivalen dengan arah pembebanan 0^0 dan hubungannya dengan perbedaan kedalaman yang digunakan



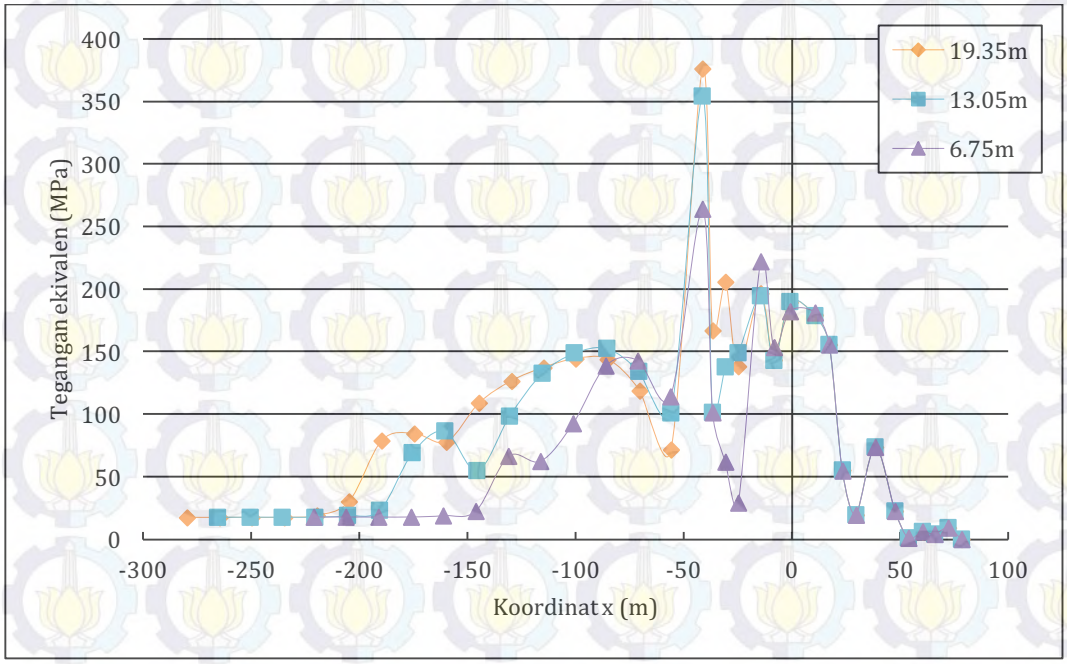
Gambar 4.20 Tegangan ekivalen arah pembebanan 0^0

Gambar 4.20 di atas merupakan grafik tegangan ekivalen untuk gelombang dengan periode ulang 10 tahun dan arus dengan periode ulang 1 tahun untuk kedalaman instalasi masing masing 6.75 m, 13.05 m, dan 19.35 m dengan arah beban lingkungan 0^0. Tegangan ekivalen terbesar yang dihasilkan untuk kedalaman 19.35 m terletak pada x=-30.75 m dengan tegangan sebesar 210.42 MPa atau setara dengan 58.61% SMYS, untuk kedalaman 13.05 m terletak pada x=-14.42 m dengan tegangan sebesar 192.49 MPa (53.62% SMYS), dan untuk kedalaman 6.75 m terletak pada x=-14.42 m dengan tegangan sebesar 219.18 MPa (61.05% SMYS). Tegangan-tegangan yang terjadi untuk arah beban lingkungan 0^0 semuanya berada dibawah 87% SMYS.

Tabel 4.5 Tegangan maksimum yang terjadi pada arah pembebanan 0^0

Kedalaman (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
19.35	210.42	STINGER	58.61	OK
13.05	192.49	STINGER	53.62	OK
6.75	219.18	STINGER	61.05	OK

b. Analisa tegangan ekivalen dengan arah pembebanan 45^0 dan hubungannya dengan perbedaan kedalaman yang digunakan



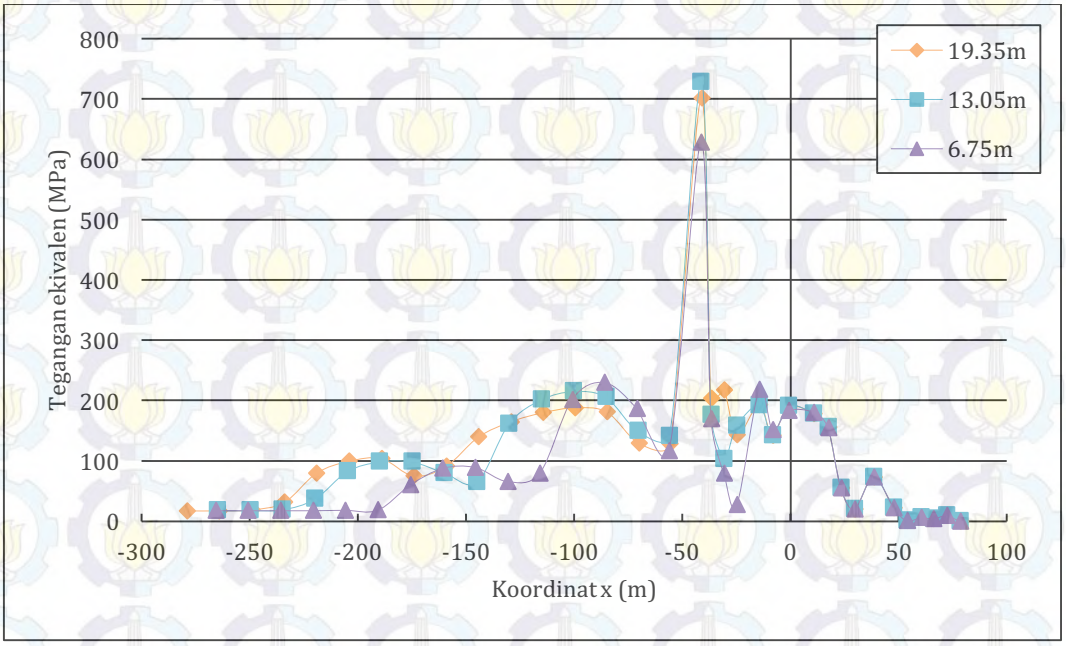
Gambar 4.21 Tegangan ekivalen arah pembebanan 45^0

Gambar 4.21 di atas merupakan grafik tegangan ekivalen untuk gelombang dengan periode ulang 10 tahun dan arus dengan periode ulang 1 tahun untuk kedalaman instalasi masing masing 6.75 m, 13.05 m, dan 19.35 m dengan arah beban lingkungan 45^0. Tegangan ekivalen terbesar yang dihasilkan untuk kedalaman 19.35 m terletak pada x=-41.25 m dengan tegangan sebesar 375.77 MPa atau setara dengan 104.67% SMYS, untuk kedalaman 13.05 m terletak pada x=-41.25 m dengan tegangan sebesar 354.01 MPa (98.61% SMYS), dan untuk kedalaman 6.75 m terletak pada x=-41.25 m dengan tegangan sebesar 263.62 MPa (73.43 % SMYS). Tegangan-tegangan yang terjadi untuk arah beban lingkungan 45^0 memiliki 2 titik yang melebihi SMYS yang diijinkan (dimana SMYS yang diijinkan <87% SMYS) masing-masing pada kedalaman 19.35 m pada x=-41.25 m dengan tegangan yang dihasilkan sebesar 104.67% SMYS dan pada kedalaman 13.05 m pada x=-41.25m dengan tegangan yang dihasilkan sebesar 98.61% SMYS.

Tabel 4.6 Tegangan maksimum yang terjadi pada arah pembebanan 45^0

Kedalaman (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
19.35	375.77	STINGER	104.67	FAIL
13.05	354.01	STINGER	98.61	FAIL
6.75	263.62	STINGER	73.43	OK

c. Analisa tegangan ekivalen dengan arah pembebanan 90^0 dan hubungannya dengan perbedaan kedalaman yang digunakan



Gambar 4.22 Tegangan ekivalen arah pembebanan 90^0

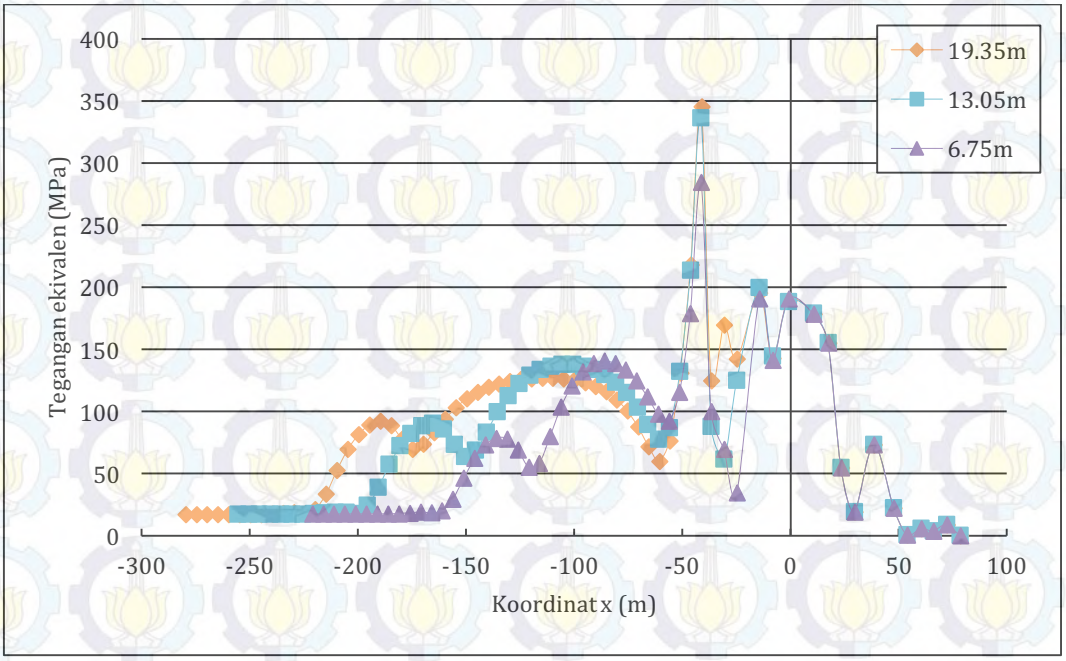
Gambar 4.22 di atas merupakan grafik tegangan ekivalen untuk gelombang dengan periode ulang 10 tahun dan arus dengan periode ulang 1 tahun untuk kedalaman instalasi masing masing 6.75 m, 13.05 m, dan 19.35 m dengan arah beban lingkungan 90^0. Tegangan ekivalen terbesar yang dihasilkan untuk kedalaman 19.35 m terletak pada x=-41.25 m dengan tegangan sebesar 701.56 MPa atau setara dengan 195.42% SMYS, untuk kedalaman 13.05 m terletak pada x=-41.25 m dengan tegangan sebesar 728.51 MPa (202.93% SMYS), dan untuk

kedalaman 6.75 m terletak pada x=-41.25 m dengan tegangan sebesar 628.61 MPa (175.1 % SMYS). Tegangan-tegangan yang terjadi untuk arah beban lingkungan 90^0 memiliki 3 titik yang melebihi SMYS yang diijinkan (dimana SMYS yang diijinkan <87% SMYS) masing-masing pada kedalaman 19.35 m pada x=-41.25 m dengan tegangan yang dihasilkan sebesar 195.42% SMYS, pada kedalaman 13.05 m pada x=-41.25 m dengan tegangan yang dihasilkan sebesar 202.93% SMYS, dan pada kedalaman 6.75 m pada x=-41.25 m dengan tegangan yang dihasilkan 175.1 % SMYS.

Tabel 4.7 Tegangan maksimum yang terjadi pada arah pembebanan 90^0

Kedalaman (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
19.35	701.56	STINGER	195.42	FAIL
13.05	728.51	STINGER	202.93	FAIL
6.75	628.61	STINGER	175.10	FAIL

d. Analisa tegangan ekivalen dengan arah pembebanan 135^0 dan hubungannya dengan perbedaan kedalaman yang digunakan



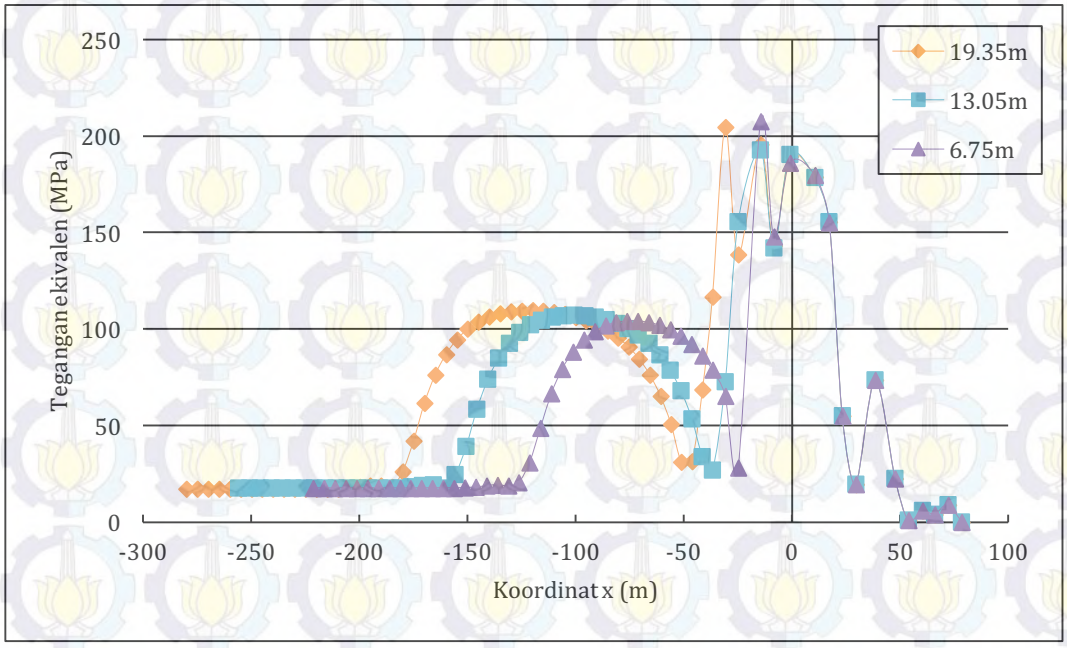
Gambar 4.23 Tegangan ekivalen arah pembebanan 135^0

Gambar 4.23 di atas merupakan grafik tegangan ekivalen untuk gelombang dengan periode ulang 10 tahun dan arus dengan periode ulang 1 tahun untuk kedalaman instalasi masing masing 6.75 m, 13.05 m, dan 19.35 m dengan arah beban lingkungan 135^0. Tegangan ekivalen terbesar yang dihasilkan untuk kedalaman 19.35 m terletak pada x=-41.25 m dengan tegangan sebesar 345.29 MPa atau setara dengan 96.18% SMYS, untuk kedalaman 13.05 m terletak pada x=-41.25 m dengan tegangan sebesar 336.01 MPa (93.59 % SMYS), dan untuk kedalaman 6.75 m terletak pada x=-41.25 m dengan tegangan sebesar 284.50 MPa (79.25 % SMYS). Tegangan-tegangan yang terjadi untuk arah beban lingkungan 135^0 memiliki 2 titik yang melebihi SMYS yang diijinkan (dimana SMYS yang diijinkan <87% SMYS) masing-masing pada kedalaman 19.35 m pada x=-41.25 m dengan tegangan yang dihasilkan sebesar 96.18% SMYS dan pada kedalaman 13.05 m pada x=-41.25 m dengan tegangan yang dihasilkan sebesar 93.59% SMYS.

Tabel 4.8 Tegangan maksimum yang terjadi pada arah pembebanan 135^0

Kedalaman (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
19.35	345.29	STINGER	96.18	FAIL
13.05	336.01	STINGER	93.59	FAIL
6.75	284.50	STINGER	79.25	OK

e. Analisa tegangan ekivalen dengan arah pembebanan 180^0 dan hubungannya dengan perbedaan kedalaman yang digunakan



Gambar 4.24 Tegangan ekivalen arah pembebanan 180^0

Gambar 4.24 di atas merupakan grafik tegangan ekivalen untuk gelombang dengan periode ulang 10 tahun dan arus dengan periode ulang 1 tahun untuk kedalaman instalasi masing masing 6.75 m, 13.05 m, dan 19.35 m dengan arah beban lingkungan 180^0. Tegangan ekivalen terbesar yang dihasilkan untuk kedalaman 19.35 m terletak pada x=-30.75 m dengan tegangan sebesar 204.62 MPa atau setara dengan 57.0% SMYS, untuk kedalaman 13.05 m terletak pada x=-14.42 m dengan tegangan sebesar 192.58 MPa (53.64% SMYS), dan untuk

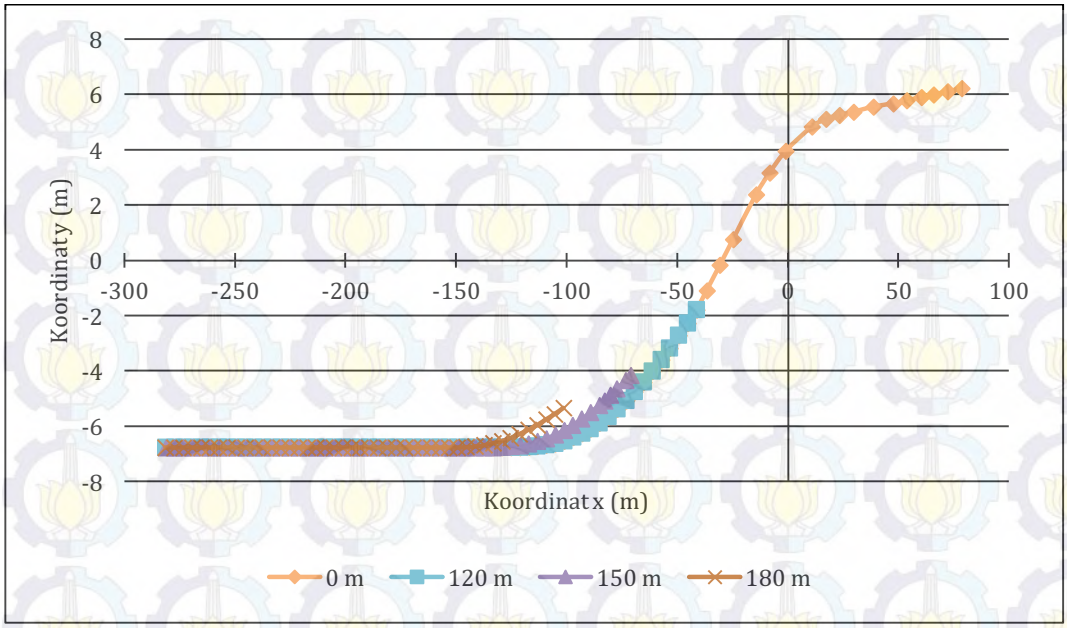
kedalaman 6.75 m terletak pada x=-14.42 m dengan tegangan sebesar 207.52 MPa (57.81% SMYS). Tegangan-tegangan yang terjadi untuk arah beban lingkungan 180^0 semuanya berada dibawah 87% SMYS.

Tabel 4.9 Tegangan maksimum yang terjadi pada arah pembebanan 180^0

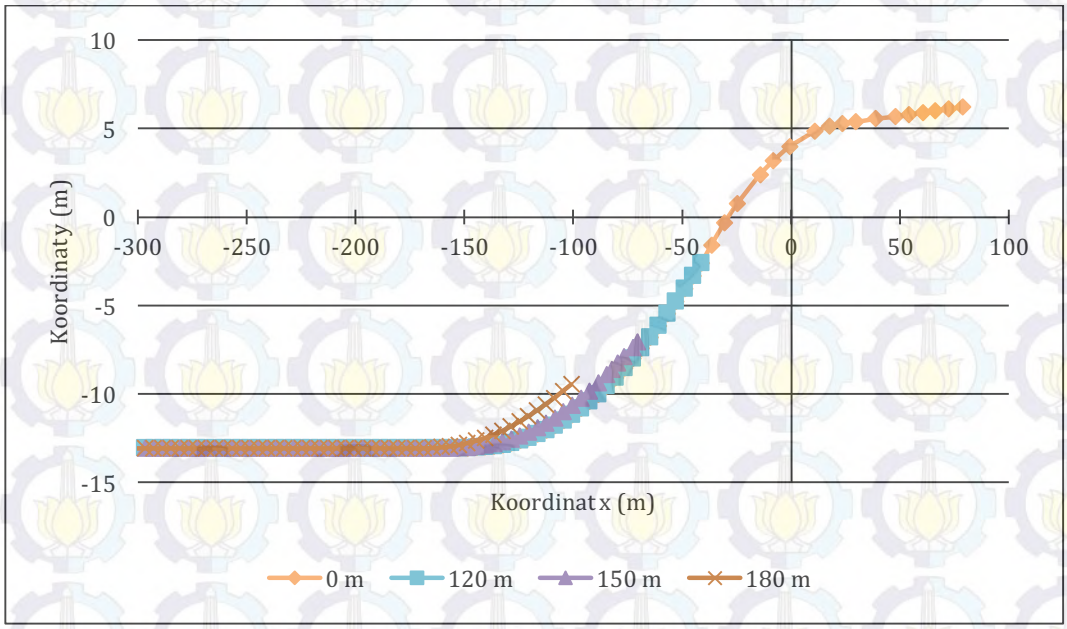
Kedalaman (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
19.35	204.62	STINGER	57.00	OK
13.05	192.58	STINGER	53.64	OK
6.75	207.52	STINGER	57.81	OK

4.5 Abandonment and Recovery

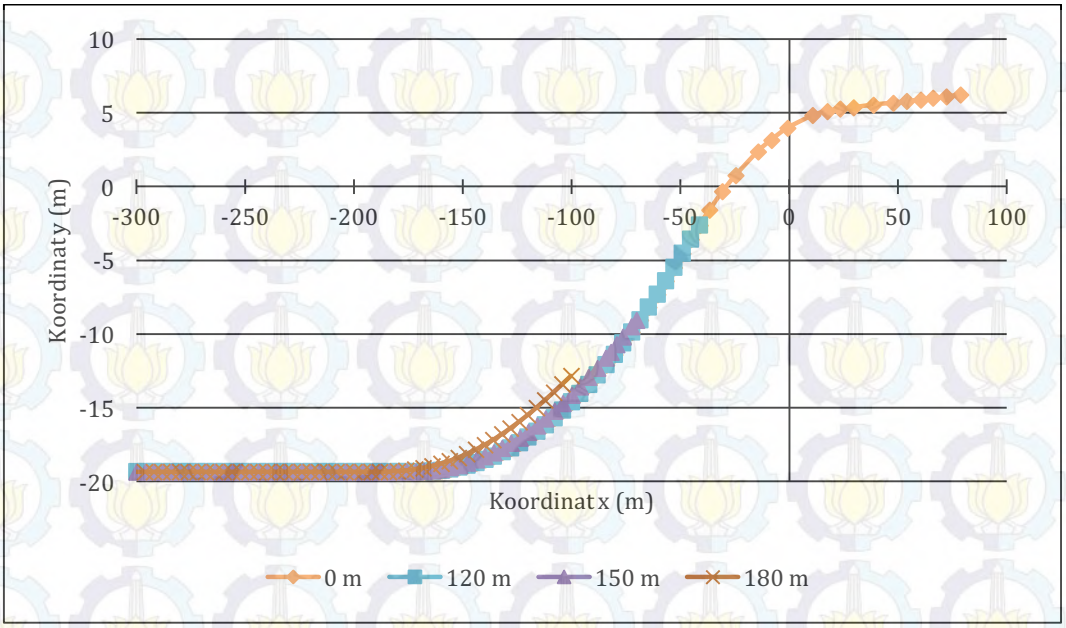
Analisa *abandonment and recovery* (AR) dilakukan menggunakan 3 panjang *winch cable* untuk 3 kedalaman yang berbeda yang mewakili keseluruhan proses *abandonment and recovery*. Panjang *winch cable* yang digunakan adalah 120 m, 150 m, dan 180 m. Panjang *winch cable* yang digunakan dimulai dari tumpuan pertama pipa pada barge (lihat Gambar 4.10). Panjang *winch cable* 120 m mewakili pipa pada saat hendak meninggalkan *barge*. Pada saat ini pipa hanya tertumpu di ujung *stinger*. Untuk *winch cable* dengan panjang 150 m dan 180 m menyatakan posisi pipa pada saat sudah diturunkan namun belum sepenuhnya terletak pada dasar laut. Gambar 4.25, 4.26, dan 4.27 dibawah ini menjelaskan hubungan antara panjang *winch cable* yang digunakan terhadap lokasi pipa pada saat *abandonment and recovery* (AR). Koordinat yang digunakan sama seperti yang dijelaskan sebelumnya dimana x=0 berada pada *bow barge* yang digunakan sedangkan y=0 menyatakan muka air.



Gambar 4.25 Hubungan panjang *winch cable* yang digunakan terhadap posisi pipa pada saat AR (d=6.75 m)



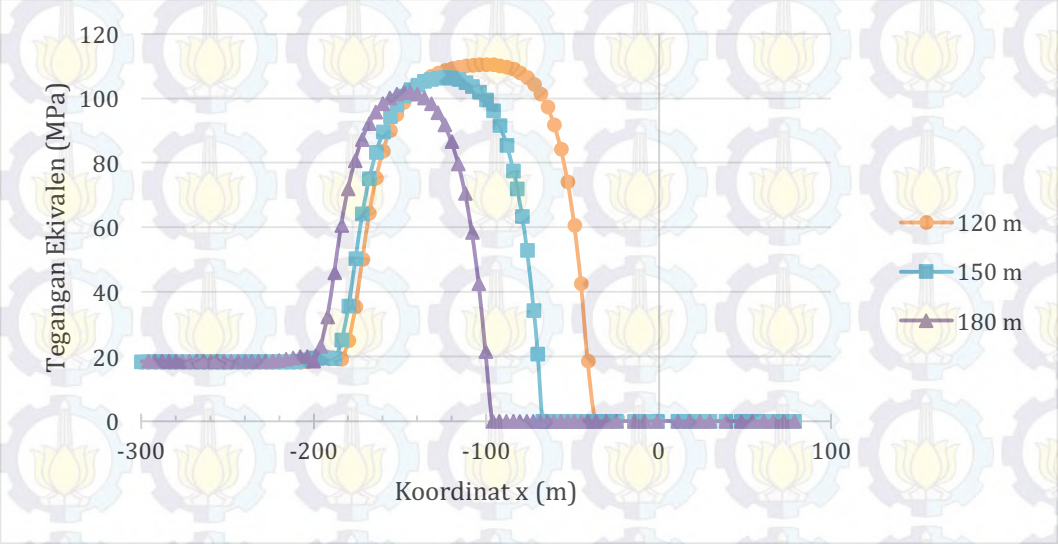
Gambar 4.26 Hubungan panjang *winch cable* yang digunakan terhadap posisi pipa pada saat AR (d=13.05 m)



Gambar 4.27 Hubungan panjang *winch cable* yang digunakan terhadap posisi pipa pada saat AR (d=19.35 m)

Adapun hasil analisa *abandonment and recovery* (AR) yang dilakukan untuk mengetahui tegangan yang terjadi pada pipa selama penurunan/penaikan pipa dilakukan. Hasil analisa *abandonment and recovery* diperoleh dengan bantuan OFFPIPE dan menghasilkan hasil seperti yang dijelaskan melalui grafik pada Gambar 4.28 sampai dengan Gambar 4.42 berikut ini.

a. Analisa tegangan ekivalen proses AR pada kedalaman 19.35 m dengan arah pembebanan 0^0



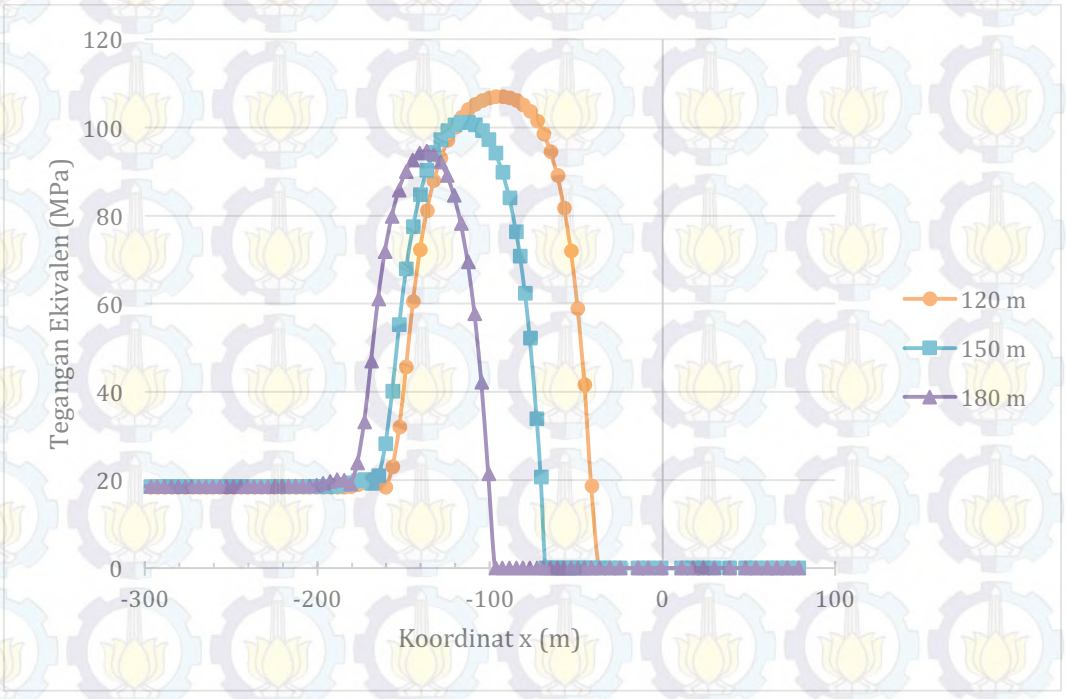
Gambar 4.28 Tegangan ekivalen proses AR pada kedalaman 19.35 m dengan arah pembebanan 0^0

Tegangan proses AR dengan kedalaman 19.35 meter dengan arah pembebanan 0^0 ditunjukkan melalui grafik pada Gambar 4.28 diatas. Tegangan terbesar yang terjadi pada AR dengan penggunaan *winch cable* dengan panjang 120 m terjadi pada koordinat x,y pada -100,-14.63 dengan tegangan sebesar 110.46 MPa (30.77% SMYS). Pada penggunaan *winch cable* dengan panjang 150 m menghasilkan tegangan maksimum pada koordinat -123.93,-17.03 dengan tegangan sebesar 106.46 MPa (29.65% SMYS). Pada penggunaan *winch cable* dengan panjang 180 m tegangan maksimum terjadi pada koordinat -148.07,-18.13 dengan tegangan sebesar 101.92 MPa (28.39% SMYS). *Touchdown point* (TDP) untuk masing-masing penggunaan *winch cable* diatas adalah pada -171.78 m, -175.86 m, dan -188.05 m untuk masing-masing *winch cable* dengan panjang 120 m, 150 m, dan 180 m.

Tabel 4.10 Tegangan maksimum yang terjadi pada proses AR pada kedalaman 19.35 m dengan arah pembebanan 0^0

Panjang kabel *winch* (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
120	110.46	SAGBEND	30.77	OK
150	106.46	SAGBEND	29.65	OK
180	101.92	SAGBEND	28.39	OK

b. Analisa tegangan ekivalen proses AR pada kedalaman 13.05 m dengan arah pembebanan 0^0



Gambar 4.29 Tegangan ekivalen proses AR pada kedalaman 13.05 m dengan arah pembebanan 0^0

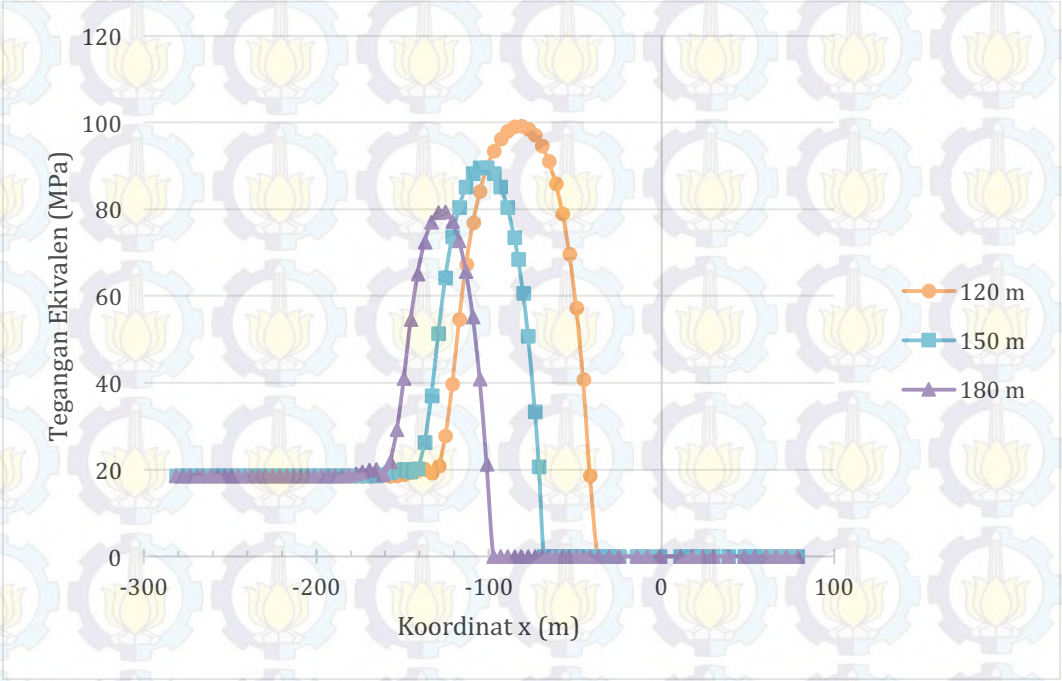
Tegangan proses AR dengan kedalaman 13.05 meter dengan arah pembebanan 0^0 ditunjukkan melalui grafik pada Gambar 4.29 diatas. Tegangan terjadi pada AR dengan penggunaan panjang *winch cable* 120 m menghasilkan tegangan maksimum pada koordinat x,y pada -92.64,-10.45 dengan tegangan

sebesar 107.05 MPa (29.82% SMYS). Pada penggunaan *winch cable* dengan panjang 150 m tegangan maksimum terjadi pada koordinat -112.67,-11.66 dengan tegangan sebesar 101.22 MPa (28.20% SMYS). Pada penggunaan *winch cable* dengan panjang 180 m tegangan maksimum terjadi pada koordinat -136.79,-12.30 dengan tegangan sebesar 94.63 MPa (26.36% SMYS). *Touchdown point* (TDP) untuk masing-masing penggunaan *winch cable* diatas adalah pada -148.55 m, -156.64 m, dan -168.78 m untuk masing-masing panjang *winch cable* 120 m, 150 m, dan 180 m.

Tabel 4.11 Tegangan maksimum yang terjadi pada proses AR pada kedalaman 13.05 m dengan arah pembebanan 0^0

Panjang kabel *winch* (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
120	107.05	SAGBEND	29.82	OK
150	101.22	SAGBEND	28.20	OK
180	94.63	SAGBEND	26.36	OK

c. Analisa tegangan ekivalen proses AR pada kedalaman 6.75 m dengan arah pembebanan 0^0



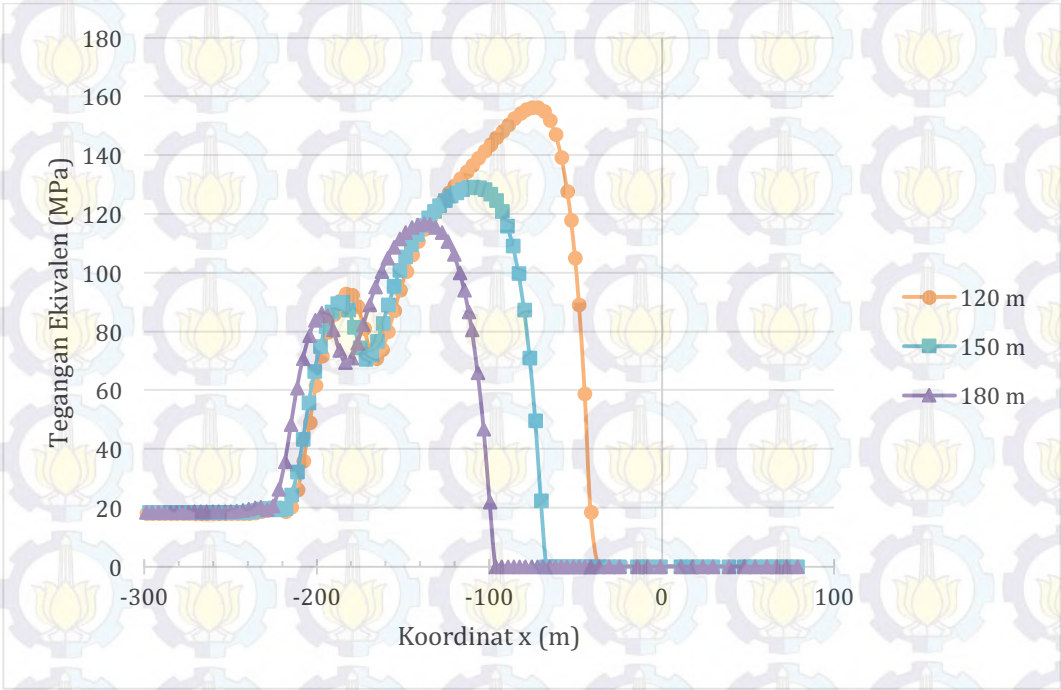
Gambar 4.30 Tegangan ekivalen proses AR pada kedalaman 6.75 m dengan arah pembebanan 0^0

Tegangan proses AR dengan kedalaman 6.75 meter dengan arah pembebanan 0^0 ditunjukkan melalui grafik pada Gambar 4.30 diatas. Tegangan terbesar yang terjadi pada AR untuk penggunaan *winch cable* dengan panjang 120 m terjadi pada koordinat x,y pada -81.21,-5.65 sebesar 99.11 MPa (27.61% SMYS). Pada penggunaan *winch cable* dengan panjang 150 m tegangan maksimum terjadi pada koordinat -101.28,-6.14 dengan tegangan sebesar 89.64 MPa (24.97% SMYS). Pada penggunaan *winch cable* dengan panjang 180 m tegangan maksimum terjadi pada koordinat -125.36,-6.42 dengan tegangan sebesar 79.37 MPa (22.11% SMYS). *Touchdown point* (TDP) untuk masing-masing penggunaan *winch cable* diatas adalah pada -117.18 m, -129.27 m, dan -149.35 m untuk masing-masing panjang *winch cable* 120 m, 150 m, dan 180 m.

Tabel 4.12 Tegangan maksimum yang terjadi pada proses AR pada kedalaman 6.75 m dengan arah pembebanan 0^0

Panjang kabel *winch* (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
120	99.11	SAGBEND	27.61	OK
150	89.63	SAGBEND	24.97	OK
180	79.37	SAGBEND	22.11	OK

d. Analisa tegangan ekivalen proses AR pada kedalaman 19.35 m dengan arah pembebanan 45^0



Gambar 4.31 Tegangan ekivalen proses AR pada kedalaman 19.35 m dengan arah pembebanan 45^0

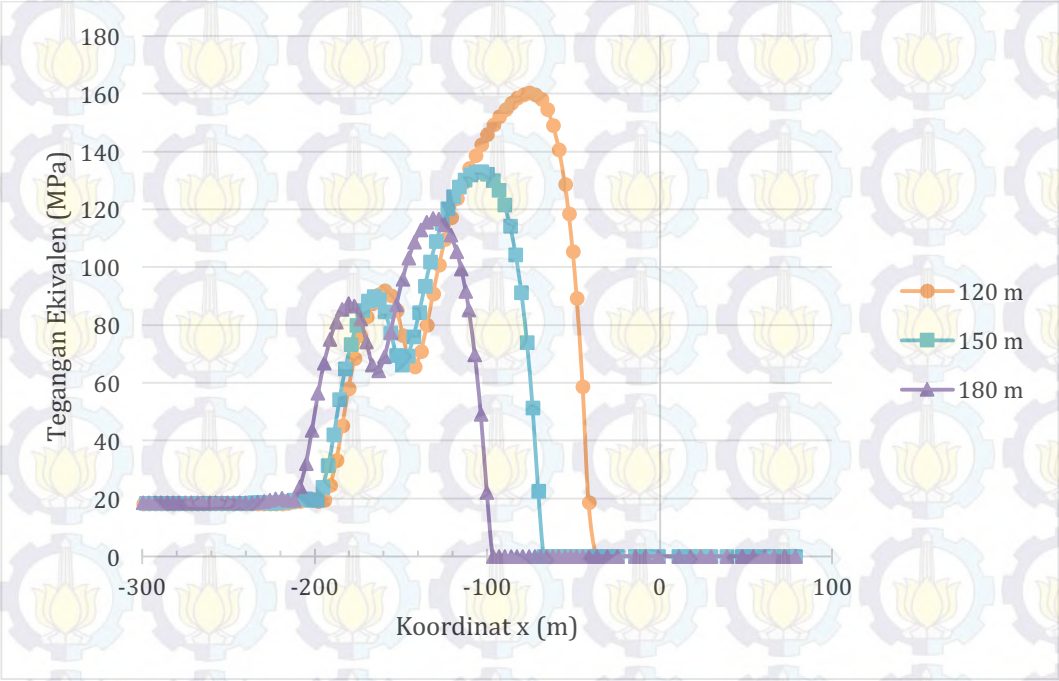
Tegangan proses AR dengan kedalaman 19.35 meter dengan arah pembebanan 45^0 ditunjukkan melalui grafik pada Gambar 4.31 diatas. Tegangan terbesar yang terjadi pada AR untuk penggunaan panjang *winch cable* 120 m

dengan tegangan maksimum yang terjadi pada koordinat x,y pada -75.13,-10.75 sebesar 156.21 MPa (43.51% SMYS). Pada penggunaan *winch cable* dengan panjang 150 m tegangan maksimum terjadi pada koordinat -109.28,-15.65 dengan tegangan sebesar 129.13 MPa (35.97% SMYS). Pada penggunaan *winch cable* dengan panjang 180 m tegangan maksimum terjadi pada koordinat -138.0,-17.54 dengan tegangan sebesar 116.17 MPa (32.53% SMYS). *Touchdown point* (TDP) untuk masing-masing penggunaan *winch cable* diatas adalah pada -168.99 m, -174.94 m, dan -183.41 m untuk masing-masing panjang *winch cable* 120 m, 150 m, dan 180 m.

Tabel 4.13 Tegangan maksimum yang terjadi pada proses AR pada kedalaman 19.35 m dengan arah pembebanan 45^0

Panjang kabel *winch* (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
120	156.21	SAGBEND	43.51	OK
150	129.13	SAGBEND	35.97	OK
180	116.77	SAGBEND	32.53	OK

e. Analisa tegangan ekivalen proses AR pada kedalaman 13.05 m dengan arah pembebanan 45^0



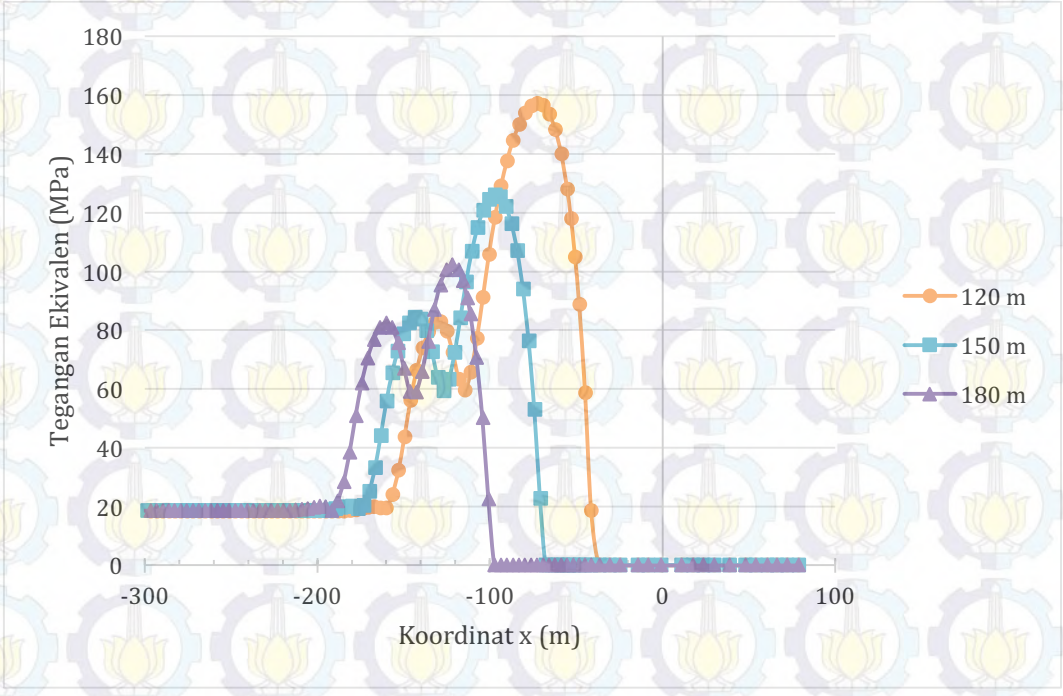
Gambar 4.32 Tegangan ekivalen proses AR pada kedalaman 13.05 m dengan arah pembebanan 45^0

Tegangan proses AR dengan kedalaman 13.05 meter dengan arah pembebanan 45^0 ditunjukkan melalui grafik pada Gambar 4.32 diatas. Tegangan terbesar yang terjadi pada AR untuk penggunaan *winch cable* dengan panjang 120 m terjadi pada koordinat x,y pada -75.59,-8.63 dengan tegangan sebesar 160.18 MPa (44.62% SMYS). Pada penggunaan *winch cable* dengan panjang 150 m tegangan maksimum terjadi pada koordinat -103.26,-11.1 dengan tegangan sebesar 132.96 MPa (37.04% SMYS). Pada penggunaan panjang *winch cable* 180 m tegangan maksimum terjadi pada koordinat -131.72,-12.16 dengan tegangan sebesar 116.81 MPa (32.54% SMYS). *Touchdown point* (TDP) untuk masing-masing penggunaan *winch cable* diatas adalah pada -145.33 m, -152.66 m, dan -166.66 m untuk masing-masing panjang *winch cable* 120 m, 150 m, dan 180 m.

Tabel 4.14 Tegangan maksimum yang terjadi pada proses AR pada kedalaman 13.05 m dengan arah pembebanan 45^0

Panjang kabel *winch* (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
120	160.18	SAGBEND	44.62	OK
150	132.96	SAGBEND	37.04	OK
180	116.81	SAGBEND	32.54	OK

f. Analisa tegangan ekivalen proses AR pada kedalaman 6.75 m dengan arah pembebanan 45^0



Gambar 4.33 Tegangan ekivalen proses AR pada kedalaman 6.75 m dengan arah pembebanan 45^0

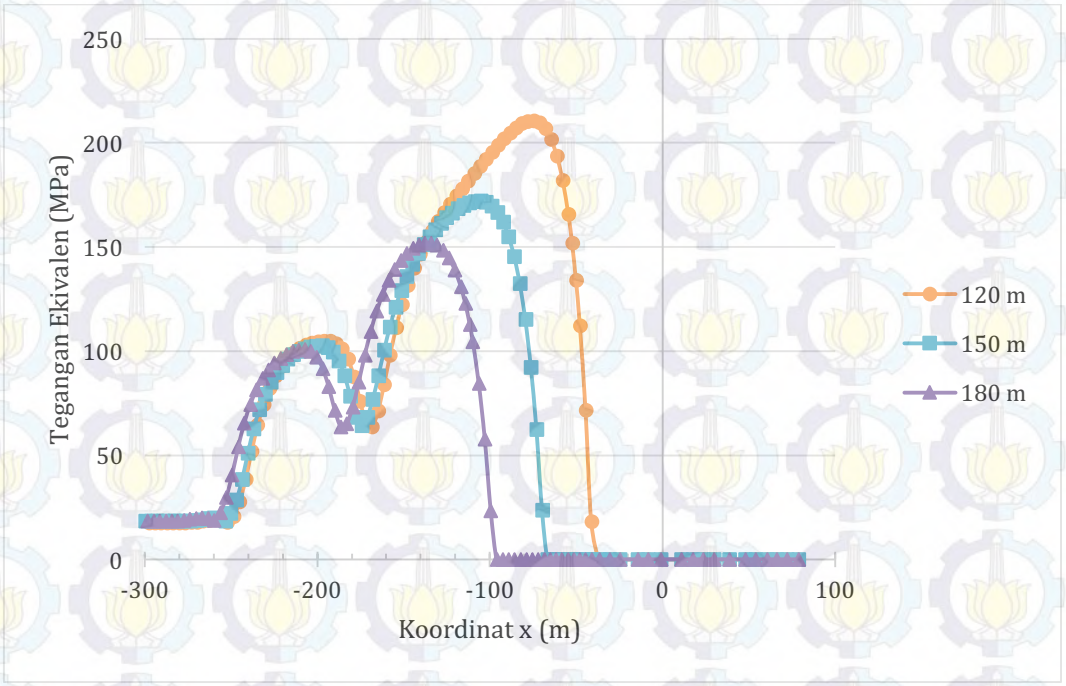
Tegangan proses AR dengan kedalaman 6.75 meter dengan arah pembebanan 45^0 ditunjukkan melalui grafik pada Gambar 4.33 diatas. Tegangan terbesar yang terjadi pada AR untuk penggunaan panjang *winch cable* 120 m terjadi pada koordinat x,y pada -72.64,-5.21 dengan tegangan sebesar 157.27

MPa (43.81% SMYS). Pada penggunaan *winch cable* dengan panjang 150 m tegangan maksimum terjadi pada koordinat -97.3,-6.25 dengan tegangan sebesar 126.13 MPa (35.13% SMYS). Pada penggunaan *winch cable* dengan panjang 180 m tegangan maksimum terjadi pada koordinat -121.81,-6.36 dengan tegangan sebesar 102.31 MPa (28.5% SMYS). *Touchdown point* (TDP) untuk masing-masing penggunaan *winch cable* diatas adalah pada -114.59 m, -126.97 m, dan -146.28 m untuk masing-masing panjang *winch cable* 120 m, 150 m, dan 180 m.

Tabel 4.15 Tegangan maksimum yang terjadi pada proses AR pada kedalaman 6.75 m dengan arah pembebanan 45^0

Panjang kabel *winch* (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
120	157.27	SAGBEND	43.81	OK
150	126.13	SAGBEND	35.13	OK
180	102.31	SAGBEND	28.50	OK

g. Analisa tegangan ekivalen proses AR pada kedalaman 19.35 m dengan arah pembebanan 90^0



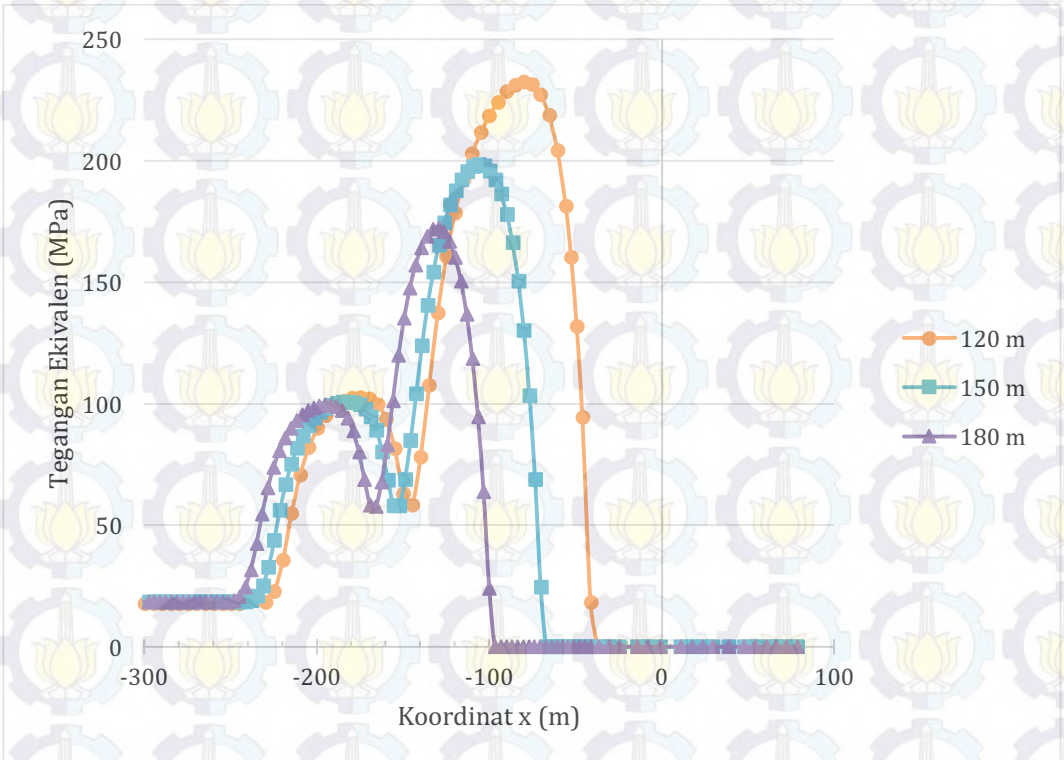
Gambar 4.34 Tegangan ekivalen proses AR pada kedalaman 19.35 m dengan arah pembebanan 90^0

Tegangan proses AR dengan kedalaman 19.35 meter dengan arah pembebanan 90^0 ditunjukkan melalui grafik pada Gambar 4.34 diatas. Tegangan terbesar yang terjadi pada AR untuk penggunaan *winch cable* 120 m terjadi pada koordinat x,y pada -74.68,-10.28 dengan tegangan sebesar 210.66 MPa (58.68% SMYS). Pada penggunaan *winch cable* dengan panjang 150 m tegangan maksimum terjadi pada koordinat -105.47,-14.83 dengan tegangan sebesar 172.11 MPa (47.94% SMYS). Pada penggunaan *winch cable* dengan panjang 180 m tegangan maksimum terjadi pada koordinat -137.75,-17.32 dengan tegangan sebesar 151.97 MPa (42.33% SMYS). *Touchdown point* (TDP) untuk masing-masing penggunaan panjang *winch cable* diatas adalah pada -171.74 m, -177.65 m, dan -186.53 m untuk masing-masing panjang *winch cable* 120 m, 150 m, dan 180 m.

Tabel 4.16 Tegangan maksimum yang terjadi pada proses AR pada kedalaman 19.35 m dengan arah pembebanan 90^0

Panjang kabel *winch* (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
120	210.66	SAGBEND	58.68	OK
150	172.11	SAGBEND	47.94	OK
180	151.97	SAGBEND	42.33	OK

h. Analisa tegangan ekivalen proses AR pada kedalaman 13.05 m dengan arah pembebanan 90^0



Gambar 4.35 Tegangan ekivalen proses AR pada kedalaman 13.05 m dengan arah pembebanan 90^0

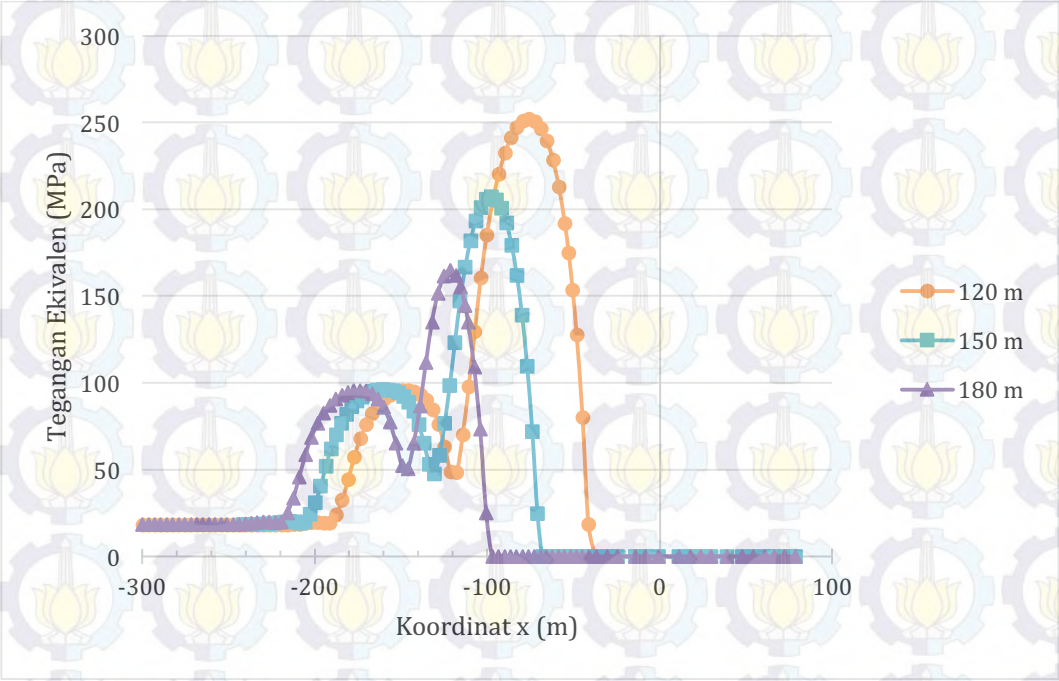
Tegangan proses AR dengan kedalaman 13.05 meter dengan arah pembebanan 90^0 ditunjukkan melalui grafik pada Gambar 4.35 diatas. Tegangan terbesar yang terjadi pada AR dengan penggunaan panjang *winch cable* 120 m

terjadi pada koordinat x,y pada -80.07,-9.01 dengan tegangan sebesar 232.42 MPa (64.74% SMYS). Pada penggunaan *winch cable* dengan panjang 150 m tegangan maksimum terjadi pada koordinat -106.11,-11.13 dengan tegangan sebesar 198.39 MPa (55.26% SMYS). Pada penggunaan *winch cable* dengan panjang 180 m tegangan maksimum terjadi pada koordinat -129.53,-11.91 dengan tegangan sebesar 172.41 MPa (48.02% SMYS). *Touchdown point* (TDP) untuk masing-masing penggunaan panjang *winch cable* diatas adalah pada -149.67 m, -155.37 m, dan -168.95 m untuk masing-masing panjang *winch cable* 120 m, 150 m, dan 180 m.

Tabel 4.17 Tegangan maksimum yang terjadi pada proses AR pada kedalaman 13.05 m dengan arah pembebanan 90^0

Panjang kabel *winch* (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
120	232.42	SAGBEND	64.74	OK
150	198.39	SAGBEND	55.26	OK
180	172.41	SAGBEND	48.02	OK

i. Analisa tegangan ekivalen proses AR pada kedalaman 6.75 m dengan arah pembebanan 90^0



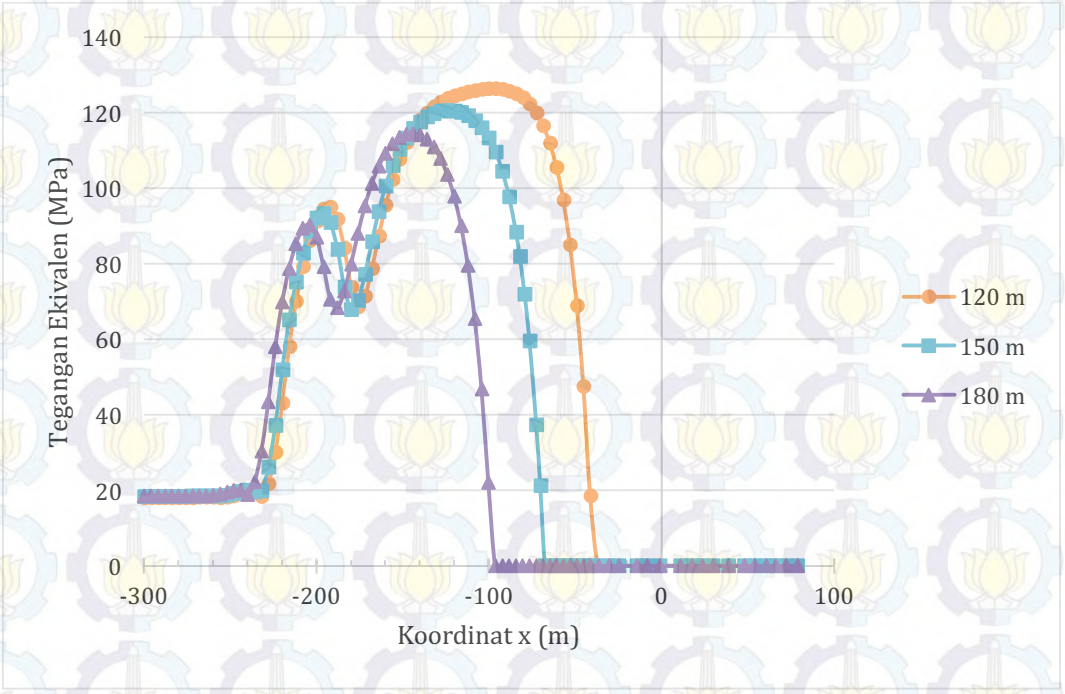
Gambar 4.36 Tegangan ekivalen proses AR pada kedalaman 6.75 m dengan arah pembebanan 90^0

Tegangan proses AR dengan kedalaman 6.75 meter dengan arah pembebanan 90^0 ditunjukkan melalui grafik pada Gambar 4.36 diatas. Tegangan terbesar yang terjadi pada AR dengan penggunaan panjang *winch cable* 120 m terjadi pada koordinat x,y pada -75.86,-5.34 dengan tegangan sebesar 252.01 MPa (70.2% SMYS). Pada penggunaan *winch cable* dengan panjang 150 m tegangan maksimum terjadi pada koordinat -97.89,-5.98 dengan tegangan sebesar 207.32 MPa (57.75% SMYS). Pada penggunaan *winch cable* dengan panjang 180 m tegangan maksimum terjadi pada koordinat -121.6,-6.31 dengan tegangan sebesar 165.1 MPa (45.99% SMYS). *Touchdown point* (TDP) untuk masing-masing penggunaan panjang *winch cable* diatas adalah pada -117.75 m, -130.78 m, dan -146.02 m untuk masing-masing panjang *winch cable* 120 m, 150 m, dan 180 m.

Tabel 4.18 Tegangan maksimum yang terjadi pada proses AR pada kedalaman 6.75 m dengan arah pembebanan 90^0

Panjang kabel *winch* (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
120	252.01	SAGBEND	70.20	OK
150	207.32	SAGBEND	57.75	OK
180	165.10	SAGBEND	45.99	OK

j. Analisa tegangan ekivalen proses AR pada kedalaman 19.35 m dengan arah pembebanan 135^0



Gambar 4.37 Tegangan ekivalen proses AR pada kedalaman 19.35 m dengan arah pembebanan 135^0

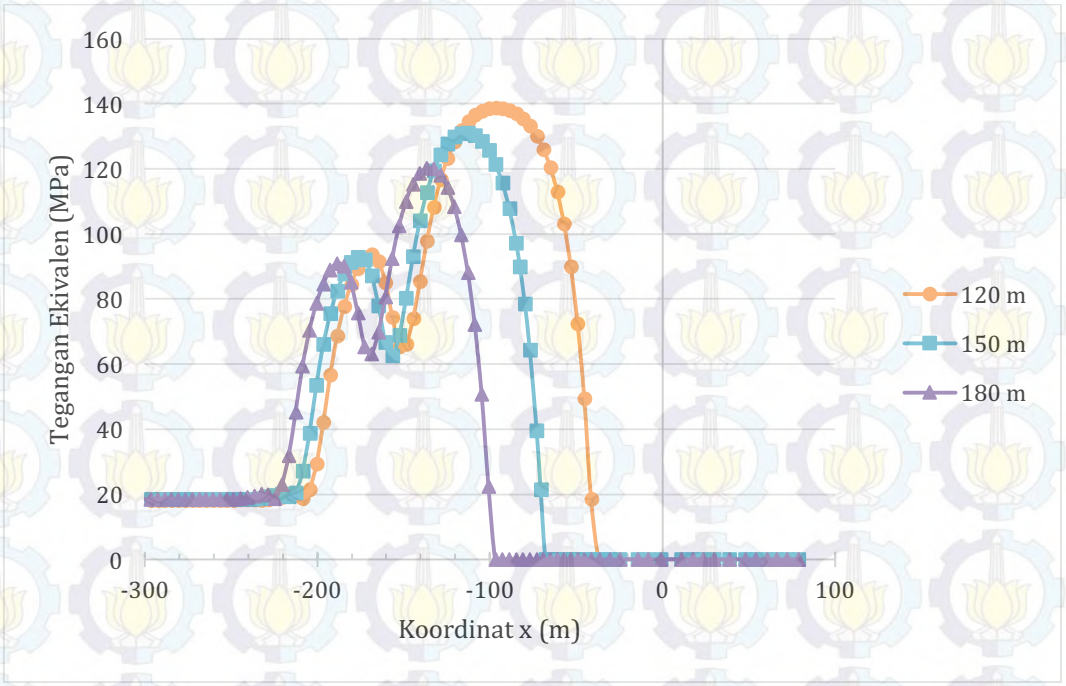
Tegangan proses AR dengan kedalaman 19.38 meter dengan arah pembebanan 135^0 ditunjukkan melalui grafik pada Gambar 4.37 diatas. Tegangan terbesar yang terjadi pada AR dengan penggunaan panjang *winch cable* 120 m terjadi pada koordinat x,y pada -96.01,-13.4 dan -99,01,-13.44 dengan tegangan yang sama sebesar sebesar 126.23 MPa (35.16% SMYS). Pada penggunaan *winch*

cable dengan panjang 150 m tegangan maksimum terjadi pada koordinat -123.89,-16.57 dengan tegangan sebesar 120.54 MPa (33.58% SMYS). Pada penggunaan *winch cable* dengan panjang 180 m tegangan maksimum terjadi pada koordinat -144.06,-17.56 dengan tegangan sebesar 114.48 MPa (31.89% SMYS). *Touchdown point* (TDP) untuk masing-masing penggunaan panjang *winch cable* diatas adalah pada -179.62 m, -183.72 m, dan -191.95 m untuk masing-masing panjang *winch cable* 120 m, 150 m, dan 180 m.

Tabel 4.19 Tegangan maksimum yang terjadi pada proses AR pada kedalaman 19.35 m dengan arah pembebanan 135^0

Panjang kabel *winch* (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
120	126.23	SAGBEND	35.16	OK
150	120.54	SAGBEND	33.58	OK
180	114.48	SAGBEND	31.89	OK

k. Analisa tegangan ekivalen proses AR pada kedalaman 13.05 m dengan arah pembebanan 135^0



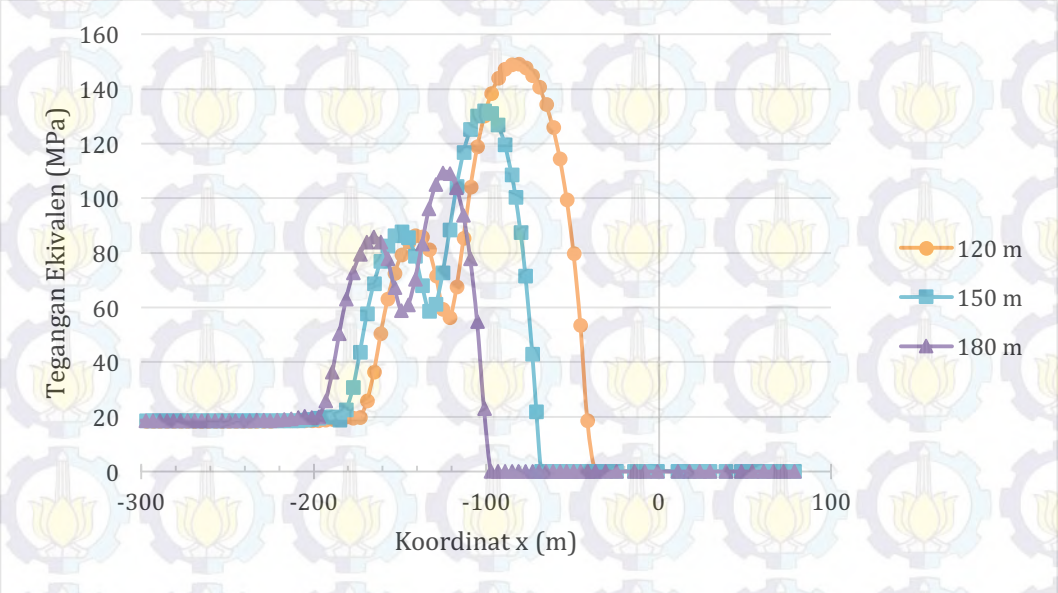
Gambar 4.38 Tegangan ekivalen proses AR pada kedalaman 13.05 m dengan arah pembebanan 135^0

Tegangan proses AR dengan kedalaman 13.05 meter dengan arah pembebanan 135^0 ditunjukkan melalui grafik pada Gambar 4.38 diatas. Tegangan terbesar yang terjadi pada AR dengan penggunaan panjang *winch cable* 120 m terjadi pada koordinat x,y pada -96.54,-10.44 dengan tegangan sebesar 138.75 MPa (38.65% SMYS). Pada penggunaan *winch cable* dengan panjang 150 m tegangan maksimum terjadi pada koordinat -112.59,-11.35 dengan tegangan sebesar 131.09 MPa (36.51% SMYS). Pada penggunaan *winch cable* dengan panjang 180 m tegangan maksimum terjadi pada koordinat -136.73,-12.13 dengan tegangan sebesar 120.24 MPa (33.49% SMYS). *Touchdown point* (TDP) untuk masing-masing penggunaan panjang *winch cable* diatas adalah pada -152.4 m, -160.48 m, dan -172.67 m untuk masing-masing panjang *winch cable* 120 m, 150 m, dan 180 m.

Tabel 4.20 Tegangan maksimum yang terjadi pada proses AR pada kedalaman 13.05 m dengan arah pembebanan 135^0

Panjang kabel *winch* (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
120	138.75	SAGBEND	38.65	OK
150	131.09	SAGBEND	36.51	OK
180	120.24	SAGBEND	33.49	OK

l. Analisa tegangan ekivalen proses AR pada kedalaman 6.75 m dengan arah pembebanan 135^0



Gambar 4.39 Tegangan ekivalen proses AR pada kedalaman 6.75 m dengan arah pembebanan 135^0

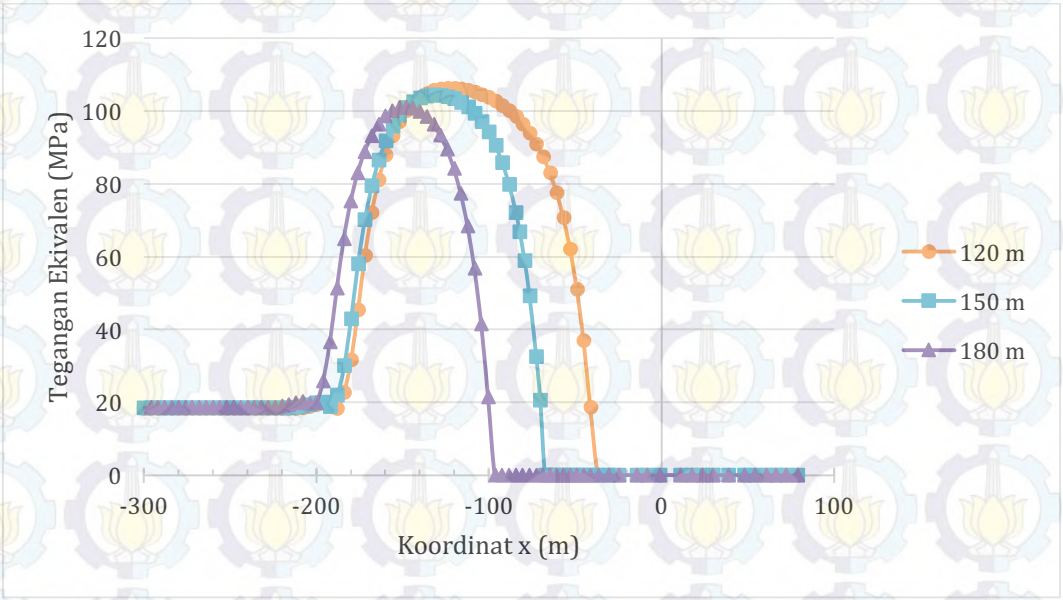
Tegangan proses AR dengan kedalaman 6.75 meter dengan arah pembebanan 135^0 ditunjukkan melalui grafik pada Gambar 4.39 diatas. Tegangan terbesar yang terjadi pada AR dengan penggunaan panjang *winch cable* 120 m terjadi pada koordinat x,y pada -81.16,-5.43 dengan tegangan sebesar 149.08 MPa (41.53% SMYS). Pada penggunaan *winch cable* dengan panjang 150 m tegangan maksimum terjadi pada koordinat -101.21,-6.02 dengan tegangan

sebesar 132.08 MPa (36.79% SMYS). Pada penggunaan *winch cable* dengan panjang 180 m tegangan maksimum terjadi pada koordinat -125.31,-6.35 dengan tegangan sebesar 109.3 MPa (30.44% SMYS). *Touchdown point* (TDP) untuk masing-masing penggunaan panjang *winch cable* diatas adalah pada -125.1 m, -133.16 m, dan -149.28 m untuk masing-masing panjang *winch cable* 120 m, 150 m, dan 180 m.

Tabel 4.21 Tegangan maksimum yang terjadi pada proses AR pada kedalaman 6.75 m dengan arah pembebanan 135^0

Panjang kabel *winch* (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
120	149.08	SAGBEND	41.53	OK
150	132.08	SAGBEND	36.79	OK
180	109.30	SAGBEND	30.44	OK

m. Analisa tegangan ekivalen proses AR pada kedalaman 19.35 m dengan arah pembebanan 180^0



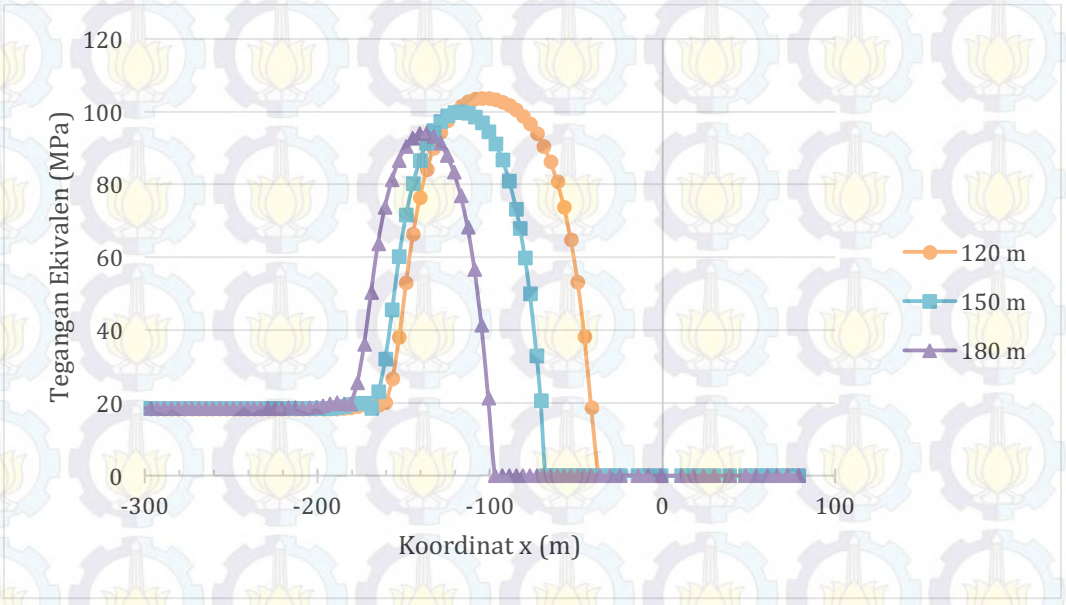
Gambar 4.40 Tegangan ekivalen proses AR pada kedalaman 19.35 m dengan arah pembebanan 180^0

Tegangan proses AR dengan kedalaman 19.35 meter dengan arah pembebanan 180^0 ditunjukkan melalui grafik pada Gambar 4.40 diatas. Tegangan terbesar yang terjadi pada AR dengan penggunaan panjang *winch cable* 120 m terjadi pada koordinat x,y pada -123.91,-17.14 dengan tegangan sebesar 106.19 MPa (29.58% SMYS). Pada penggunaan *winch cable* dengan panjang 150 m tegangan maksimum terjadi pada koordinat -131.94,-17.57 dengan tegangan sebesar 104.32 MPa (29.06% SMYS). Pada penggunaan *winch cable* dengan panjang 180 m tegangan maksimum terjadi pada koordinat -148.1,-18.03 dengan tegangan sebesar 101.03 MPa (28.14% SMYS). *Touchdown point* (TDP) untuk masing-masing penggunaan panjang *winch cable* diatas adalah pada -175.84 m, -179.9 m, dan -188.07 m untuk masing-masing panjang *winch cable* 120 m, 150 m, dan 180 m.

Tabel 4.22 Tegangan maksimum yang terjadi pada proses AR pada kedalaman 19.35 m dengan arah pembebanan 180^0

Panjang kabel *winch* (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
120	106.19	SAGBEND	29.58	OK
150	104.32	SAGBEND	29.06	OK
180	101.03	SAGBEND	28.14	OK

n. Analisa tegangan ekivalen proses AR pada kedalaman 13.05 m dengan arah pembebanan 180^0



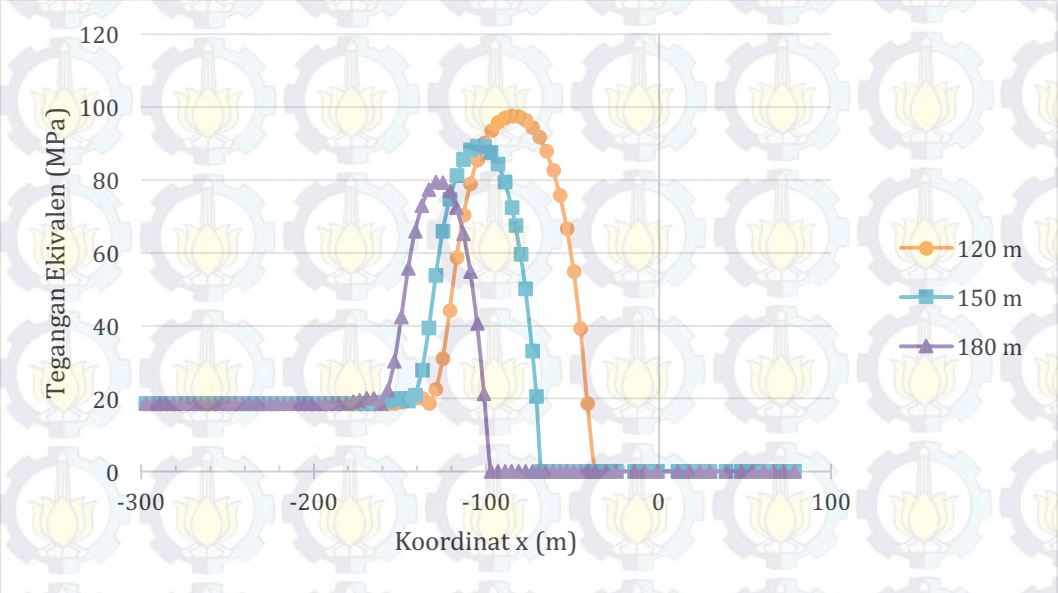
Gambar 4.41 Tegangan ekivalen proses AR pada kedalaman 13.05 m dengan arah pembebanan 180^0

Tegangan proses AR dengan kedalaman 13.05 meter dengan arah pembebanan 180^0 ditunjukkan melalui grafik pada Gambar 4.41 diatas. Tegangan terbesar yang terjadi pada AR dengan penggunaan panjang *winch cable* 120 m terjadi pada koordinat x,y pada -104.62,-11.39 dengan tegangan sebesar 103.65 MPa (28.87% SMYS). Pada penggunaan *winch cable* dengan panjang 150 m tegangan maksimum terjadi pada koordinat -116.68,-11.84 dengan tegangan sebesar 99.93 MPa (27.83% SMYS). Pada penggunaan *winch cable* dengan panjang 180 m tegangan maksimum terjadi pada koordinat -136.8,-12.26 dengan tegangan sebesar 94.14 MPa (26.22% SMYS). *Touchdown point* (TDP) untuk masing-masing penggunaan panjang *winch cable* diatas adalah pada -148.58 m, -156.66 m, dan -168.79 m untuk masing-masing panjang *winch cable* 120 m, 150 m, dan 180 m.

Tabel 4.23 Tegangan maksimum yang terjadi pada proses AR pada kedalaman 13.05 m dengan arah pembebanan 180^0

Panjang kabel *winch* (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
120	103.65	SAGBEND	28.87	OK
150	99.93	SAGBEND	27.83	OK
180	94.14	SAGBEND	26.22	OK

o. Analisa tegangan ekivalen proses AR pada kedalaman 6.75 m dengan arah pembebanan 180^0



Gambar 4.42 Tegangan ekivalen proses AR pada kedalaman 6.75 m dengan arah pembebanan 180^0

Tegangan proses AR dengan kedalaman 6.75 meter dengan arah pembebanan 180^0 ditunjukkan melalui grafik pada Gambar 4.42 diatas. Tegangan terbesar yang terjadi pada AR dengan penggunaan panjang *winch cable* 120 m terjadi pada koordinat x,y pada -85.21,-5.82 dengan tegangan sebesar 103.65 MPa (28.87% SMYS). Pada penggunaan *winch cable* dengan panjang 150 m tegangan maksimum terjadi pada koordinat -105.28,-6.28 dengan tegangan

sebesar 89.38 MPa (24.9% SMYS). Pada penggunaan *winch cable* dengan panjang 180 m tegangan maksimum terjadi pada koordinat -129.36,-6.52 dengan tegangan sebesar 79.42 MPa (22.12% SMYS). *Touchdown point* (TDP) untuk masing-masing penggunaan panjang *winch cable* diatas adalah pada -121.19 m, -133.27 m, dan -149.35 m untuk masing-masing panjang *winch cable* 120 m, 150 m, dan 180 m.

Tabel 4.24 Tegangan maksimum yang terjadi pada proses AR pada kedalaman 6.75 m dengan arah pembebanan 180^0

Panjang kabel *winch* (m)	Tegangan maksimum (MPa)	Lokasi	SMYS (%)	Status
120	97.62	SAGBEND	27.19	OK
150	89.38	SAGBEND	24.90	OK
180	79.42	SAGBEND	22.12	OK

Dari hasil analisa tegangan *abandonment and recovery* dapat diketahui bahwa tegangan terbesar dihasilkan oleh arah pembebanan 90^0 untuk kedalaman 6.75 m dengan panjang *winch cable* 120 m menghasilkan tegangan 252 MPa setara dengan 70.2% SMYS pada wilayah *sagbend*. Tegangan tersebut berada dibawah tegangan yang maksimum yang diijinkan yaitu 87% SMYS.

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BAB V
KESIMPULAN DAN SARAN

5.1 Kesimpulan

Berdasarkan analisa dan pembahasan yang dilakukan dalam tugas akhir ini, maka dapat ditarik kesimpulan dari permasalah yang diangkat adalah:

1. Gelombang dapat mempengaruhi tegangan yang terjadi. Arah datang gelombang mempengaruhi tegangan khususnya pada bagian ujung *stinger*. Tegangan-tegangan yang terjadi yang melebihi tegangan yang diijinkan (87% SMYS atau 312.33 MPa) dengan tegangan terbesar terjadi untuk arah datang gelombang dan arus 90^0 untuk kedalaman 13.05 m pada ujung *stinger* sebesar 728.51 MPa (202.93% SMYS), sedangkan untuk kedalaman 19.35 m dan 6.75 m menghasilkan tegangan pada ujung *stinger* masing-masing 701.56 MPa (195.42% SMYS) dan 628.61 MPa (175.1% SMYS). Tegangan untuk arah pembebanan arus dan gelombang 45^0 adalah pada kedalaman 19.35 m sebesar 375.77 MPa (104.67% SMYS) pada kedalaman 13.05 m sebesar 354.01 MPa (98.61% SMYS). Tegangan untuk arah pembebanan arus dan gelombang 135^0 adalah pada kedalaman 19.35 m sebesar 345.29 MPa (96.18% SMYS) pada kedalaman 13.05 m sebesar 336.01 MPa (93.59% SMYS).
2. Analisa *abandonment and recovery* tegangan tidak melebihi tegangan yang diijinkan (87% SMYS). Tegangan pada proses AR yang terbesar terjadi pada kedalaman 6.75 m dengan panjang *winch cable* yang digunakan 120 m menghasilkan tegangan 252 MPa setara dengan 70.2% SMYS pada wilayah *sagbend*.

5.2 Saran

Saran yang diberikan untuk penelitian selanjutnya mengenai tugas akhir ini adalah sebagai berikut:

1. Permodelan lebih detail mengenai sambungan *winch cable* dan *pipeline* dan menghitung kekuatan antar sambungan tersebut.

2. Permodelan yang lebih mendetail mengenai interaksi *pipelaying barge* dengan *mooring*.
3. Permodelan yang lebih mendetail terhadap bangunan atas pada barge.

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   DYNAMIC TRACKING OF PIPE DATA .....NO
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   COATED PIPE AVG MOMENT OF INERTIA .       .00 CM**4
   WEIGHT PER-UNIT-LENGTH IN AIR .....       .00 N/M
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   STEEL WALL THICKNESS ..............    1.2700 CM
   YIELD STRESS ......................    359.00 MPA
   STRESS/STRAIN INTENSE FACTOR ......     .0000
   HYDRODYNAMIC OUTSIDE DIAMETER .....      .000 CM
   DRAG COEFFICIENT ..................     .0000
   HYDRODYNAMIC TOTAL AREA ...........      .000 CM**2
   ADDED MASS COEFFICIENT ............     .0000
   POISSON'S RATIO ...................     .3000
   COEFFICIENT OF THERMAL EXPANSION .. .00000000 1/DEG C

CABLE PROPERTIES
================
   PIPE PROPERTY TABLE INDEX .........          1
   CABLE SECTION LENGTH ..............      .000 M
   AXIAL STIFFNESS (EA) ..............       .00 KN
   BENDING STIFFNESS (EI) ............     .0000 KN-M**2
   WEIGHT PER-UNIT-LENGTH IN AIR .....       .0 N/M
   WEIGHT PER-UNIT-LENGTH SUBMERGED ..       .0 N/M

   CABLE DIAMETER ....................     3.800 CM
   DRAG COEFFICIENT ..................      .000
   CABLE CROSS SECTIONAL AREA ........      .000 KN
   ADDED MASS COEFFICIENT ............      .000


================================================================================
OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE   6
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PIPE COATING PROPERTIES
=======================
   PIPE PROPERTY TABLE INDEX .........          2
   CORROSION COATING THICKNESS .......       .550 CM
   CONCRETE COATING THICKNESS ........      2.540 CM
   STEEL WEIGHT DENSITY ..............    77009. N/M**3
   CORROSION COATING WEIGHT DENSITY ..    12750. N/M**3
   CONCRETE COATING WEIGHT DENSITY ...    29860. N/M**3
   DESIRED PIPE SPECIFIC GRAVITY .....     .0000

   AVERAGE PIPE JOINT LENGTH .........    12.100 M
   FIELD JOINT LENGTH ................      .000 M
   JOINT FILL WEIGHT DENSITY .........    10052. N/M**3
   DENSITY OF PIPE CONTENTS ..........       0. N/M**3

PIPE TENSION
============
   STATIC PIPE TENSION ON LAYBARGE ...   294.200 KN
   MINIMUM DYNAMIC PIPE TENSION ......      .000 KN
   MAXIMUM DYNAMIC PIPE TENSION ......      .000 KN

LAYBARGE DESCRIPTION
====================
   NUMBER OF PIPE NODES ..............        11
```

```
   BARGE GEOMETRY SPECIFIED BY .......         1 X-Y COORDINATES
   OVERBEND PIPE SUPPORT RADIUS ......   300.000 M
   TANGENT POINT X-COORDINATE ........      .000 M
   TANGENT POINT Y-COORDINATE ........      .000 M
   PIPE ANGLE RELATIVE TO DECK .......    .0000 DEG
   HEIGHT OF DECK ABOVE WATER ........     3.600 M
   LAYBARGE FORWARD (X) OFFSET .......      .000 M
   BARGE TRIM ANGLE ..................    .0000 DEG

   STERN SHOE X COORDINATE ..........      .000 M
   STERN SHOE Y COORDINATE ...........     .000 M
   ROTATION CENTER X COORDINATE ......   13.750 M
   ROTATION CENTER Y COORDINATE ......   -3.600 M
   ROTATION CENTER Z COORDINATE ......     .000 M
   BARGE HEADING .....................    .0000 DEG
   BARGE OFFSET FROM RIGHT-OF-WAY ....     .000 M
   PIPE RAMP PIVOT X COORDINATE ......     .000 M
   PIPE RAMP PIVOT Y COORDINATE ......     .000 M
   PIPE RAMP PIVOT ROTATION ANGLE ....     .000 DEG


================================================================================
OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC         PAGE   7
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                        I N P U T   D A T A   E C H O


    NODE X      NODE Y          SUPPORT          DAVIT
     COORD       COORD            TYPE          SPACING
     (M   )      (M   )                          (M   )
   ========   ========   ====================   =======
     78.480      2.608     1  SIMPLE SUPPORT        .000
     72.120      2.498     1  SIMPLE SUPPORT        .000
     65.950      2.390     1  SIMPLE SUPPORT        .000
     60.430      2.293     1  SIMPLE SUPPORT        .000
     53.790      2.177     1  SIMPLE SUPPORT        .000
     47.730      2.071     1  SIMPLE SUPPORT        .000
     38.540      1.951     2  PIPE TENSIONER        .000
     29.530      1.754     1  SIMPLE SUPPORT        .000
     23.330      1.646     1  SIMPLE SUPPORT        .000
     17.330      1.507     1  SIMPLE SUPPORT        .000
     10.720      1.220     1  SIMPLE SUPPORT        .000

STINGER DESCRIPTION
===================
   NUMBER OF PIPE/STINGER NODES ......         7
   STINGER GEOMETRY SPECIFIED BY .....         1 X-Y COORD AND TANGENT PT
   STINGER TYPE ......................         1 FIXED GEOMETRY OR RAMP
   OVERBEND PIPE SUPPORT RADIUS ......       .00 M
   HITCH X-COORDINATE ................      .000 M
   HITCH Y-COORDINATE ................     3.600 M

   X COORDINATE OF LOCAL ORIGIN ......      .000 M
   Y COORDINATE OF LOCAL ORIGIN ......      .000 M
   ROTATION ABOUT STINGER HITCH ......      .000 DEG
   TANGENT POINT X-COORDINATE ........      .000 M
   TANGENT POINT Y-COORDINATE ........      .000 M
   TANGENT POINT ANGLE ...............      .000 DEG

    NODE X      NODE Y          SUPPORT                ELEMENT          ELEMENT
     COORD       COORD            TYPE                   TYPE           LENGTH
     (M   )      (M   )                                                  (M   )
   ========   ========   ====================   ====================   =======
      -.890       .360     1  SIMPLE SUPPORT       2  HINGED END           .000
     -8.310      -.440     1  SIMPLE SUPPORT       1  FIXED END            .000
    -14.420     -1.220     1  SIMPLE SUPPORT       1  FIXED END            .000
    -24.800     -2.860     1  SIMPLE SUPPORT       1  FIXED END            .000
    -30.750     -3.950     1  SIMPLE SUPPORT       1  FIXED END            .000
    -36.660     -5.190     1  SIMPLE SUPPORT       1  FIXED END            .000
    -41.250     -6.210     1  SIMPLE SUPPORT       2  HINGED END           .000


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OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC         PAGE   8
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CURRENT VELOCITIES
==================
    WATER      CURRENT      DIRECTION
    DEPTH       SPEED       OF TRAVEL
   (M   )      (M/S )        (DEG )
   ======     =======      =========
     .000       3.500        90.000
    9.675       2.700        90.000
   19.350       1.900        90.000

SAGBEND GEOMETRY
================
   SAGBEND PIPE ELEMENT LENGTH .......    15.000 M
   WATER DEPTH .......................    19.35 M
   ESTIMATED SAGBEND X LENGTH ........      .00 M
   ESTIMATED PIPE LENGTH ON SEABED ...   100.00 M
   X-COORD OF PIPE FREE END ON SEABED       .00 M
   ESTIMATED SPAN DEPTH FOR BOW LINE .      .00 M
   PIPE VERTICAL ANGLE AT SEABED .....     .000 DEG
   X-COORDINATE OF SPECIFIED DEPTH ...      .00 M
   MAXIMUM SLOPE (ANGLE) OF SEABED ...     .000 DEG
   DIRECTION OF MAXIMUM SLOPE ........     .000 DEG

SAGBEND PIPE ELEMENT LENGTHS
============================
  NUMBER OF     ELEMENT
   ELEMENTS      LENGTH
                 (M   )
  ---------     -------
     100         15.000

WAVE SPECTRUM COEFFICIENTS
```

```
==========================
   NUMBER OF WAVES IN SPECTRUM .......        20
   1ST SPECTRUM COEFFICIENT ..........    1.0506 M2/S4
   2ND SPECTRUM COEFFICIENT ..........     .3249 1/S**4
   MINIMUM FREQUENCY IN SPECTRUM .....     .1000 RAD/S
   MAXIMUM FREQUENCY IN SPECTRUM .....    2.5000 RAD/S
   DIRECTION OF WAVE TRAVEL ..........    90.000 DEG

TIME INTEGRATION PARAMETERS
=======================
   TIME STEP LENGTH ..................     .4000 SEC
   SOLUTION STARTS AT TIME ...........    60.000 SEC
   MAXIMUM TIME OF INTEGRATION ....... 10860.000 SEC
   SOLUTION SAMPLING TIME STEP........     .800 SEC
   DAMPING RATIO .....................    .0000


================================================================================
OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE   9
Abandonment and Recovery
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                        I N P U T   D A T A   E C H O


BARGE MOTION RAO TABLE ( OFFPIPE  ) SIGN CONVENTION
===================================================
     WAVE    /------ SURGE -----/  /------ SWAY -----/  /------ HEAVE -----/
  FREQUENCY   AMPLITUDE    PHASE    AMPLITUDE    PHASE    AMPLITUDE    PHASE
  (RAD/S  )    (M/M  )     (DEG)     (M/M  )     (DEG)     (M/M  )     (DEG)
  =========    =======   =======    =======    =======    =======   =======
     .1000      .0000        .00      .0000        .00     1.0000        .00
     .2260      .0000        .00      .0000        .00     1.0000        .00
     .3530      .0000        .00      .0000        .00      .9990       -.10
     .4790      .0000        .00      .0000        .00      .9940       -.50
     .6050      .0000        .00      .0000        .00      .9780      -1.50
     .7320      .0000        .00      .0000        .00      .9360      -3.20
     .8580      .0000        .00      .0000        .00      .8570      -5.90
     .9840      .0000        .00      .0000        .00      .7200      -9.10
    1.1110      .0000        .00      .0000        .00      .5360      -9.30
    1.2370      .0000        .00      .0000        .00      .3660      -3.10
    1.3630      .0000        .00      .0000        .00      .2390      11.30
    1.4890      .0000        .00      .0000        .00      .1620      33.70
    1.6160      .0000        .00      .0000        .00      .1200      58.90
    1.7420      .0000        .00      .0000        .00      .0870      81.40
    1.8680      .0000        .00      .0000        .00      .0570     108.70
    1.9950      .0000        .00      .0000        .00      .0350     145.00
    2.1210      .0000        .00      .0000        .00      .0290    -162.40
    2.2470      .0000        .00      .0000        .00      .0410    -136.50
    2.3740      .0000        .00      .0000        .00      .0600      14.90
    2.5000      .0000        .00      .0000        .00      .0190      35.10

     WAVE    /------ ROLL ------/  /------ PITCH -----/  /------- YAW ------/
  FREQUENCY   AMPLITUDE    PHASE    AMPLITUDE    PHASE    AMPLITUDE    PHASE
  (RAD/S  )   (DEG/M )     (DEG)    (DEG/M )     (DEG)    (DEG/M )     (DEG)
  =========   ========    =======   ========    =======   ========    =======
     .1000     1.0260      90.00      .0000     -16.00      .0000        .00
     .2260     1.0360      90.00      .0000     -44.20      .0000        .00
     .3530     1.0530      90.00      .0000     -60.20      .0000        .00
     .4790     1.0840      90.20      .0000     -56.50      .0000        .00
     .6050     1.1380      91.10      .0010     -45.40      .0000        .00
     .7320     1.2290      93.70      .0010     -59.10      .0000        .00
     .8580     1.3800     101.30      .0020     -97.90      .0000        .00
     .9840     1.4970     122.50      .0030    -148.20      .0000        .00
    1.1110     1.0410     153.70      .0020     156.80      .0000        .00
    1.2370      .5230     164.20      .0010      97.60      .0000        .00
    1.3630      .2660     159.60      .0010      44.70      .0000        .00
    1.4890      .1380     146.20      .0010      48.30      .0000        .00
    1.6160      .0710     125.40      .0010      33.00      .0000        .00
    1.7420      .0390      90.40      .0010      10.80      .0000        .00
    1.8680      .0270      54.60      .0010     -12.40      .0000        .00
    1.9950      .0210      28.50      .0010     -26.80      .0000        .00
    2.1210      .0130      11.20      .0000     -52.60      .0000        .00
    2.2470      .0050      -8.60      .0000    -177.60      .0000        .00


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OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE  10
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    2.3740      .0080    -116.60      .0060      13.30      .0000        .00
    2.5000      .0020      86.50      .0010     -18.00      .0000        .00


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OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE  11
Abandonment and Recovery
JOB NO. -                          LICENSED TO: RICKY TAWEKAL
USER ID - M. S. Pasengo            DATE -  7/26/2015   TIME - 23:40:13   CASE   2
================================================================================

                        I N P U T   D A T A   E C H O


CABLE PROPERTIES
================
   PIPE PROPERTY TABLE INDEX .........        1
   CABLE SECTION LENGTH ..............   120.000 M
   AXIAL STIFFNESS (EA) ..............      .00 KN
   BENDING STIFFNESS (EI) ............    .0000 KN-M**2
   WEIGHT PER-UNIT-LENGTH IN AIR .....      .0 N/M
   WEIGHT PER-UNIT-LENGTH SUBMERGED ..      .0 N/M

   CABLE DIAMETER ....................    3.800 CM
   DRAG COEFFICIENT ..................     .000
   CABLE CROSS SECTIONAL AREA ........     .000 KN
   ADDED MASS COEFFICIENT ............     .000

SAGBEND GEOMETRY
================
   SAGBEND PIPE ELEMENT LENGTH .......   15.000 M
```

```
   WATER DEPTH ......................     19.35 M
   ESTIMATED SAGBEND X LENGTH ........    172.00 M
   ESTIMATED PIPE LENGTH ON SEABED ...    100.00 M
   X-COORD OF PIPE FREE END ON SEABED        .00 M
   ESTIMATED SPAN DEPTH FOR BOW LINE .       .00 M
   PIPE VERTICAL ANGLE AT SEABED .....       .000 DEG
   X-COORDINATE OF SPECIFIED DEPTH ...       .00 M
   MAXIMUM SLOPE (ANGLE) OF SEABED ...       .000 DEG
   DIRECTION OF MAXIMUM SLOPE ........       .000 DEG

SAGBEND PIPE ELEMENT LENGTHS
============================
  NUMBER OF     ELEMENT
   ELEMENTS      LENGTH
                 (M   )
  ---------     -------
     100          3.500
     100         30.000
     100         50.000


================================================================================
OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE  12
Abandonment and Recovery
JOB NO. -                          LICENSED TO: RICKY TAWEKAL
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================================================================================

                        I N P U T   D A T A   E C H O


CABLE PROPERTIES
================
   PIPE PROPERTY TABLE INDEX .........         1
   CABLE SECTION LENGTH ..............   150.000 M
   AXIAL STIFFNESS (EA) ..............       .00 KN
   BENDING STIFFNESS (EI) ............     .0000 KN-M**2
   WEIGHT PER-UNIT-LENGTH IN AIR .....        .0 N/M
   WEIGHT PER-UNIT-LENGTH SUBMERGED ..        .0 N/M

   CABLE DIAMETER ....................     3.800 CM
   DRAG COEFFICIENT ..................      .000
   CABLE CROSS SECTIONAL AREA ........      .000 KN
   ADDED MASS COEFFICIENT ............      .000

SAGBEND GEOMETRY
================
   SAGBEND PIPE ELEMENT LENGTH .......    15.000 M
   WATER DEPTH ......................     19.35 M
   ESTIMATED SAGBEND X LENGTH ........    172.00 M
   ESTIMATED PIPE LENGTH ON SEABED ...    100.00 M
   X-COORD OF PIPE FREE END ON SEABED        .00 M
   ESTIMATED SPAN DEPTH FOR BOW LINE .       .00 M
   PIPE VERTICAL ANGLE AT SEABED .....       .000 DEG
   X-COORDINATE OF SPECIFIED DEPTH ...       .00 M
   MAXIMUM SLOPE (ANGLE) OF SEABED ...       .000 DEG
   DIRECTION OF MAXIMUM SLOPE ........       .000 DEG

SAGBEND PIPE ELEMENT LENGTHS
============================
  NUMBER OF     ELEMENT
   ELEMENTS      LENGTH
                 (M   )
  ---------     -------
     100          3.300
     100         30.000
     100         50.000


================================================================================
OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE  13
Abandonment and Recovery
JOB NO. -                          LICENSED TO: RICKY TAWEKAL
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                        I N P U T   D A T A   E C H O


CABLE PROPERTIES
================
   PIPE PROPERTY TABLE INDEX .........         1
   CABLE SECTION LENGTH ..............   180.000 M
   AXIAL STIFFNESS (EA) ..............       .00 KN
   BENDING STIFFNESS (EI) ............     .0000 KN-M**2
   WEIGHT PER-UNIT-LENGTH IN AIR .....        .0 N/M
   WEIGHT PER-UNIT-LENGTH SUBMERGED ..        .0 N/M

   CABLE DIAMETER ....................     3.800 CM
   DRAG COEFFICIENT ..................      .000
   CABLE CROSS SECTIONAL AREA ........      .000 KN
   ADDED MASS COEFFICIENT ............      .000

SAGBEND GEOMETRY
================
   SAGBEND PIPE ELEMENT LENGTH .......    15.000 M
   WATER DEPTH ......................     19.35 M
   ESTIMATED SAGBEND X LENGTH ........    172.00 M
   ESTIMATED PIPE LENGTH ON SEABED ...    100.00 M
   X-COORD OF PIPE FREE END ON SEABED        .00 M
   ESTIMATED SPAN DEPTH FOR BOW LINE .       .00 M
   PIPE VERTICAL ANGLE AT SEABED .....       .000 DEG
   X-COORDINATE OF SPECIFIED DEPTH ...       .00 M
   MAXIMUM SLOPE (ANGLE) OF SEABED ...       .000 DEG
   DIRECTION OF MAXIMUM SLOPE ........       .000 DEG

SAGBEND PIPE ELEMENT LENGTHS
============================
  NUMBER OF     ELEMENT
   ELEMENTS      LENGTH
                 (M   )
  ---------     -------
     100          3.500
     100         30.000
     100         50.000

END OF INPUT DATA
```

STATIC SOLUTION CONVERGED IN (17) ITERATIONS

STATIC SOLUTION CONVERGED IN (34) ITERATIONS

STATIC SOLUTION CONVERGED IN (99) ITERATIONS

STATIC SOLUTION CONVERGED IN (86) ITERATIONS

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	BENDING STRESSES HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
1	LAYBARGE	78.48	6.21	.00	.000	1.001	.000	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.000	.994	6.361	-.02	.00	-8.80	.00	8.81	2.46
5	LAYBARGE	65.95	5.99	.00	.000	1.005	12.532	-.03	.00	-3.88	.00	3.91	1.09
7	LAYBARGE	60.43	5.89	.00	.000	1.011	18.053	-.05	.00	-5.70	.00	5.75	1.60
9	LAYBARGE	53.79	5.78	.00	.000	.981	24.694	-.06	.00	.76	.00	.83	.23
11	LAYBARGE	47.73	5.68	.00	.000	.846	30.755	-.08	.00	22.44	.00	22.52	6.27
13	TENSIONR	38.54	5.55	.00	.000	.910	39.945	18.63	.00	-54.81	.00	73.44	20.46
15	LAYBARGE	29.53	5.38	.00	.000	1.105	48.958	18.61	.00	.83	.00	19.44	5.42
17	LAYBARGE	23.33	5.26	.00	.000	1.211	55.159	18.59	.00	-36.39	.00	54.98	15.31
19	LAYBARGE	17.33	5.11	.00	.000	1.871	61.160	18.55	.00	-136.88	-.01	155.43	43.30
21	LAYBARGE	10.72	4.82	.00	.000	3.136	67.777	18.49	.00	-159.92	.03	178.41	49.70
24	STINGER	-.89	3.96	.00	-.001	5.368	79.420	18.36	.00	-171.64	-.11	190.00	52.93
26	STINGER	-8.31	3.17	.00	.002	6.768	86.883	18.26	.00	-124.02	.54	142.28	39.63
28	STINGER	-14.42	2.38	.00	-.006	7.965	93.043	18.12	.00	-175.32	-2.32	193.46	53.89
30	STINGER	-24.80	.74	.00	.029	9.830	103.552	17.89	.00	-124.63	7.35	142.74	39.76
32	STINGER	-30.75	-.35	.00	-.101	11.102	109.601	17.71	-.06	-195.33	-41.92	217.52	60.59
34	STINGER	-36.66	-1.58	.00	.385	12.327	115.640	17.57	-.25	-109.22	149.97	203.22	56.61
36	STINGER	-41.25	-2.61	.00	-1.329	12.874	120.342	16.95	-.42	-49.63	-682.60	701.56	195.42
38	SAGBEND	-55.78	-6.00	1.50	-8.499	12.887	135.342	17.05	-.96	38.29	-103.44	127.83	35.61
39	SAGBEND	-70.26	-9.21	3.72	-8.275	11.733	150.342	16.66	-1.48	70.34	87.61	129.75	36.14
40	SAGBEND	-84.87	-12.06	5.55	-5.767	10.138	165.342	16.29	-1.94	84.99	139.85	180.92	50.39
41	SAGBEND	-99.63	-14.47	6.65	-2.776	8.332	180.343	15.99	-2.33	91.86	144.13	188.08	52.39
42	SAGBEND	-114.50	-16.40	6.99	.095	6.431	195.343	15.76	-2.64	94.40	132.63	179.88	50.11
43	SAGBEND	-129.43	-17.83	6.63	2.645	4.510	210.344	15.59	-2.87	93.37	114.51	164.79	45.90
44	SAGBEND	-144.37	-18.76	5.65	4.729	2.657	225.344	15.48	-3.02	86.89	86.24	139.43	38.84
45	SAGBEND	-159.29	-19.24	4.23	5.984	1.041	240.345	15.43	-3.09	68.14	28.55	90.89	25.32
46	SEABED	-174.21	-19.36	2.66	5.717	.074	255.345	15.42	-3.11	20.57	-54.07	74.88	20.86
47	SEABED	-189.15	-19.36	1.36	4.144	-.019	270.345	15.41	-3.11	-1.67	-86.79	103.81	28.92
48	SEABED	-204.13	-19.36	.51	2.388	.001	285.345	15.42	-3.11	-.18	-82.41	99.42	27.69
49	SEABED	-219.12	-19.36	.09	.862	.000	300.345	15.42	-3.11	.04	-62.87	79.89	22.25
50	SEABED	-234.12	-19.36	-.01	.030	.000	315.345	15.42	-3.11	.00	-14.09	31.18	8.69
51	SEABED	-249.12	-19.36	.00	-.014	.000	330.345	15.42	-3.11	.00	1.64	18.81	5.24
52	SEABED	-264.12	-19.36	.00	.001	.000	345.345	15.42	-3.11	.00	.06	17.25	4.80
53	SEABED	-279.12	-19.36	.00	.000	.000	360.345	15.42	-3.11	.00	.00	17.19	4.79

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
1	LAYBARGE	78.48	6.21	.00	5.42	.00	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	18.02	.00	.00	.00	-.26	-13.19	.00	13.19
5	LAYBARGE	65.95	5.99	.00	12.08	.00	.00	.00	-.51	-5.82	.00	5.82
7	LAYBARGE	60.43	5.89	.00	16.27	.00	.00	.00	-.74	-8.55	.00	8.55
9	LAYBARGE	53.79	5.78	.00	18.86	.00	.00	.00	-1.02	1.14	.00	1.14
11	LAYBARGE	47.73	5.68	.00	.00	.00	.01	.00	-1.26	33.64	.00	33.64
13	TENSIONR	38.54	5.55	.00	44.08	.00	.00	.00	292.64	-82.18	.00	82.18
15	LAYBARGE	29.53	5.38	.00	.00	.00	.03	.00	292.30	1.25	.00	1.25
17	LAYBARGE	23.33	5.26	.00	.00	.01	.02	.00	291.99	-54.56	.00	54.56
19	LAYBARGE	17.33	5.11	.00	39.89	-.01	.00	.00	291.31	-205.23	-.01	205.23
21	LAYBARGE	10.72	4.82	.00	34.04	.03	.00	.00	290.51	-239.76	.04	239.76
24	STINGER	-.89	3.96	.00	42.92	-.15	.00	.00	288.42	-257.34	-.16	257.34
26	STINGER	-8.31	3.17	.00	.00	.83	.01	.00	286.80	-185.95	.81	185.95
28	STINGER	-14.42	2.38	.00	47.22	-2.08	.00	.00	284.67	-262.85	-3.48	262.88
30	STINGER	-24.80	.74	.00	.00	11.33	.00	.00	281.09	-186.86	11.01	187.19
32	STINGER	-30.75	-.35	.00	52.68	-68.87	.00	.00	278.69	-292.86	-62.86	299.53
34	STINGER	-36.66	-1.58	.00	-.43	300.83	.01	.00	278.01	-163.76	224.85	278.16
36	STINGER	-41.25	-2.61	.00	2.51	-369.07	.00	.00	269.65	-74.41	-1023.42	1026.12
38	SAGBEND	-55.78	-6.00	1.50	.00	.00	.00	.00	275.64	57.41	-155.09	165.37
39	SAGBEND	-70.26	-9.21	3.72	.00	.00	.00	.00	273.63	105.46	131.35	168.45
40	SAGBEND	-84.87	-12.06	5.55	.00	.00	.00	.00	271.59	127.43	209.67	245.36
41	SAGBEND	-99.63	-14.47	6.65	.00	.00	.00	.00	270.04	137.72	216.09	256.25
42	SAGBEND	-114.50	-16.40	6.99	.00	.00	.00	.00	268.89	141.53	198.84	244.07
43	SAGBEND	-129.43	-17.83	6.63	.00	.00	.00	.00	268.08	139.99	171.68	221.52
44	SAGBEND	-144.37	-18.76	5.65	.00	.00	.00	.00	267.61	130.27	129.30	183.54
45	SAGBEND	-159.29	-19.24	4.23	.10	-.10	.00	.00	267.49	102.16	42.80	110.76
46	SEABED	-174.21	-19.36	2.66	9.89	-9.99	.00	.00	267.46	30.83	-81.07	86.74
47	SEABED	-189.15	-19.36	1.36	11.69	-11.69	.00	.00	267.37	-2.50	-130.13	130.15
48	SEABED	-204.13	-19.36	.51	9.25	-9.25	.00	.00	267.38	-.27	-123.55	123.55
49	SEABED	-219.12	-19.36	.09	9.35	-8.99	.00	.00	267.43	.06	-94.27	94.27
50	SEABED	-234.12	-19.36	-.01	9.38	1.98	.00	.00	267.48	.00	-21.12	21.12
51	SEABED	-249.12	-19.36	.00	9.38	1.68	.00	.00	267.48	.00	2.46	2.46
52	SEABED	-264.12	-19.36	.00	9.38	-.15	.00	.00	267.48	.00	.09	.09
53	SEABED	-279.12	-19.36	.00	.00	-.02	.00	.00	267.48	.00	.00	.00

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
1	LAYBARGE	78.48	6.21	.00	.000	.991	.000	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.000	.997	6.361	.00	.00	.00	.00	.00	.00
5	LAYBARGE	65.95	5.99	.00	.000	1.005	12.532	.00	.00	.00	.00	.00	.00
7	LAYBARGE	60.43	5.89	.00	.000	1.004	18.053	.00	.00	.00	.00	.00	.00
9	LAYBARGE	53.79	5.78	.00	.000	1.001	24.694	.00	.00	.00	.00	.00	.00
11	LAYBARGE	47.73	5.67	.00	.000	.875	30.755	.00	.00	.00	.00	.00	.00
13	TENSIONR	38.54	5.55	.00	.000	.967	39.945	.00	.00	.00	.00	.00	.00
15	LAYBARGE	29.53	5.36	.00	.000	1.140	48.958	.00	.00	.00	.00	.00	.00
17	LAYBARGE	23.33	5.25	.00	.000	1.212	55.159	.00	.00	.00	.00	.00	.00
19	LAYBARGE	17.33	5.11	.00	.000	1.907	61.160	.00	.00	.00	.00	.00	.00
21	LAYBARGE	10.72	4.82	.00	.000	3.361	67.777	.00	.00	.00	.00	.00	.00
24	STINGER	-.89	3.96	.00	.000	5.195	79.419	.00	.00	.00	.00	.00	.00
26	STINGER	-8.31	3.16	.00	.000	6.714	86.882	.00	.00	.00	.00	.00	.00
28	STINGER	-14.42	2.38	.00	.000	8.127	93.042	.00	.00	.00	.00	.00	.00
30	STINGER	-24.80	.74	.00	.000	9.680	103.551	.00	.00	.00	.00	.00	.00
32	STINGER	-30.75	-.35	.00	.000	11.115	109.600	.00	.00	.00	.00	.00	.00
34	STINGER	-36.66	-1.59	.00	-.002	12.189	115.639	.00	.00	.00	.00	.00	.00
36	STINGER	-41.25	-2.61	.00	-14.243	13.579	120.359	17.93	-.42	.00	.00	18.14	5.05
38	SAGBEND	-44.55	-3.43	.83	-14.112	13.540	123.859	17.82	-.55	16.17	51.11	71.71	19.97
39	SAGBEND	-47.85	-4.25	1.66	-13.762	13.430	127.359	17.71	-.68	29.27	89.67	112.38	31.30
40	SAGBEND	-50.10	-4.80	2.20	-13.428	13.323	129.739	17.64	-.77	36.80	110.09	134.11	37.36
41	SAGBEND	-52.36	-5.34	2.73	-13.032	13.193	132.120	17.57	-.86	43.41	126.67	151.90	42.31
42	SAGBEND	-54.48	-5.85	3.21	-12.615	13.053	134.359	17.50	-.94	48.97	139.25	165.59	46.12
43	SAGBEND	-57.82	-6.64	3.94	-11.895	12.802	137.859	17.40	-1.07	56.38	154.17	182.09	50.72
44	SAGBEND	-61.16	-7.40	4.62	-11.115	12.519	141.359	17.30	-1.19	62.57	164.38	193.79	53.98
45	SAGBEND	-64.52	-8.15	5.26	-10.295	12.209	144.859	17.21	-1.31	67.77	170.93	201.74	56.19
46	SAGBEND	-67.90	-8.88	5.84	-9.451	11.877	148.359	17.11	-1.43	72.15	174.63	206.78	57.60
47	SAGBEND	-71.28	-9.59	6.38	-8.596	11.525	151.859	17.03	-1.54	75.84	176.14	209.58	58.38
48	SAGBEND	-74.68	-10.28	6.87	-7.738	11.157	155.359	16.94	-1.65	78.96	175.98	210.66	58.68
49	SAGBEND	-78.09	-10.95	7.30	-6.886	10.775	158.859	16.86	-1.76	81.60	174.56	210.43	58.62
50	SAGBEND	-81.50	-11.59	7.69	-6.045	10.382	162.359	16.78	-1.86	83.83	172.18	209.22	58.28
51	SAGBEND	-84.93	-12.21	8.03	-5.217	9.979	165.859	16.71	-1.96	85.72	169.11	207.29	57.74
52	SAGBEND	-88.37	-12.80	8.32	-4.407	9.567	169.359	16.63	-2.06	87.30	165.54	204.82	57.05
53	SAGBEND	-91.81	-13.37	8.56	-3.616	9.149	172.859	16.57	-2.15	88.63	161.62	201.98	56.26
54	SAGBEND	-95.27	-13.92	8.76	-2.846	8.724	176.359	16.50	-2.24	89.74	157.48	198.88	55.40
55	SAGBEND	-98.72	-14.43	8.90	-2.097	8.295	179.859	16.44	-2.32	90.64	153.19	195.61	54.49
56	SAGBEND	-102.19	-14.93	9.01	-1.369	7.861	183.359	16.38	-2.40	91.37	148.83	192.23	53.55
57	SAGBEND	-105.66	-15.39	9.07	-.664	7.425	186.859	16.32	-2.47	91.93	144.44	188.78	52.59
58	SAGBEND	-109.13	-15.83	9.09	.020	6.986	190.359	16.27	-2.55	92.34	140.03	185.29	51.61
59	SAGBEND	-112.60	-16.24	9.07	.682	6.546	193.859	16.22	-2.61	92.59	135.62	181.75	50.63
60	SAGBEND	-116.08	-16.63	9.01	1.322	6.104	197.359	16.18	-2.67	92.69	131.19	178.16	49.63
61	SAGBEND	-119.56	-16.99	8.91	1.940	5.663	200.859	16.13	-2.73	92.63	126.72	174.49	48.60
62	SAGBEND	-123.04	-17.32	8.77	2.537	5.222	204.359	16.09	-2.78	92.40	122.17	170.68	47.54
63	SAGBEND	-126.53	-17.62	8.60	3.110	4.783	207.859	16.06	-2.83	91.97	117.47	166.68	46.43

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
64	SAGBEND	-130.01	-17.90	8.39	3.661	4.346	211.359	16.02	-2.88	91.31	112.53	162.40	45.24
65	SAGBEND	-133.49	-18.15	8.16	4.186	3.913	214.859	15.99	-2.92	90.38	107.24	157.72	43.93
66	SAGBEND	-136.97	-18.38	7.89	4.685	3.485	218.359	15.97	-2.96	89.13	101.45	152.51	42.48
67	SAGBEND	-140.46	-18.58	7.59	5.154	3.064	221.859	15.95	-2.99	87.49	94.98	146.60	40.84
68	SAGBEND	-143.94	-18.75	7.26	5.590	2.652	225.359	15.93	-3.02	85.38	87.57	139.76	38.93
69	SAGBEND	-147.41	-18.90	6.90	5.988	2.251	228.859	15.91	-3.04	82.68	78.94	131.76	36.70
70	SAGBEND	-150.89	-19.03	6.53	6.341	1.865	232.359	15.90	-3.06	79.24	68.69	122.32	34.07
71	SAGBEND	-154.37	-19.13	6.13	6.640	1.497	235.859	15.89	-3.08	74.89	56.35	111.18	30.97
72	SAGBEND	-157.84	-19.21	5.72	6.874	1.153	239.359	15.88	-3.09	69.40	41.32	98.23	27.36
73	SAGBEND	-161.32	-19.27	5.30	7.029	.838	242.859	15.87	-3.10	62.48	22.82	83.99	23.40
74	SAGBEND	-164.79	-19.32	4.87	7.090	.560	246.359	15.87	-3.11	53.77	2.73	71.32	19.87
75	SAGBEND	-168.26	-19.34	4.44	7.055	.329	249.859	15.87	-3.11	42.81	-17.22	63.63	17.72
76	SEABED	-171.74	-19.36	4.01	6.924	.156	253.359	15.87	-3.11	29.32	-37.79	65.31	18.19
77	SEABED	-175.21	-19.36	3.59	6.698	.048	256.859	15.87	-3.11	16.44	-56.23	76.05	21.18
78	SEABED	-178.69	-19.36	3.19	6.396	-.007	260.359	15.86	-3.11	7.13	-69.86	87.69	24.43
79	SEABED	-182.17	-19.36	2.81	6.040	-.026	263.859	15.86	-3.11	1.64	-78.68	96.15	26.78
80	SEABED	-185.65	-19.36	2.46	5.651	-.027	267.359	15.86	-3.11	-.93	-83.74	101.19	28.19
81	SEABED	-189.13	-19.36	2.13	5.245	-.020	270.859	15.86	-3.11	-1.69	-86.29	103.76	28.90
82	SEABED	-192.62	-19.36	1.82	4.831	-.012	274.359	15.86	-3.11	-1.54	-87.34	104.80	29.19
83	SEABED	-196.11	-19.36	1.54	4.414	-.006	277.859	15.86	-3.11	-1.08	-87.53	104.99	29.25
84	SEABED	-199.60	-19.36	1.28	3.997	-.002	281.359	15.86	-3.11	-.62	-87.22	104.68	29.16
85	SEABED	-203.09	-19.36	1.05	3.582	.000	284.859	15.86	-3.11	-.28	-86.54	104.00	28.97
86	SEABED	-206.59	-19.36	.84	3.172	.001	288.359	15.86	-3.11	-.07	-85.48	102.94	28.67
87	SEABED	-210.08	-19.36	.66	2.768	.001	291.859	15.86	-3.11	.03	-83.98	101.43	28.25
88	SEABED	-213.58	-19.36	.50	2.372	.001	295.359	15.86	-3.11	.06	-81.90	99.36	27.68
89	SEABED	-217.08	-19.36	.37	1.988	.000	298.859	15.86	-3.11	.06	-79.12	96.58	26.90
90	SEABED	-220.57	-19.36	.26	1.619	.000	302.359	15.86	-3.11	.04	-75.46	92.92	25.88
91	SEABED	-224.07	-19.36	.17	1.270	.000	305.859	15.86	-3.11	.02	-70.72	88.18	24.56
92	SEABED	-227.57	-19.36	.11	.947	.000	309.359	15.86	-3.11	.01	-64.62	82.09	22.87
93	SEABED	-231.07	-19.36	.06	.657	.000	312.859	15.87	-3.11	.00	-56.86	74.33	20.70
94	SEABED	-234.57	-19.36	.02	.408	.000	316.359	15.87	-3.11	.00	-47.00	64.48	17.96
95	SEABED	-238.07	-19.36	.01	.213	.000	319.859	15.87	-3.11	.00	-34.56	52.05	14.50
96	SEABED	-241.57	-19.36	.00	.081	.000	323.359	15.87	-3.11	.00	-20.89	38.41	10.70
97	SEABED	-245.07	-19.36	-.01	.009	.000	326.859	15.87	-3.11	.00	-10.06	27.62	7.69
98	SEABED	-248.57	-19.36	-.01	-.022	.000	330.359	15.87	-3.11	.00	-3.21	20.81	5.80
99	SEABED	-252.07	-19.36	.00	-.027	.000	333.859	15.87	-3.11	.00	.29	17.92	4.99
100	SEABED	-255.57	-19.36	.00	-.022	.000	337.359	15.87	-3.11	.00	1.56	19.17	5.34
101	SEABED	-259.07	-19.36	.00	-.014	.000	340.859	15.87	-3.11	.00	1.63	19.25	5.36
102	SEABED	-262.57	-19.36	.00	-.008	.000	344.359	15.87	-3.11	.00	1.23	18.85	5.25
103	SEABED	-266.07	-19.36	.00	-.003	.000	347.859	15.87	-3.11	.00	.74	18.37	5.12
104	SEABED	-269.57	-19.36	.00	.000	.000	351.359	15.87	-3.11	.00	.36	17.99	5.01
105	SEABED	-273.07	-19.36	.00	.001	.000	354.859	15.87	-3.11	.00	.12	17.75	4.94
106	SEABED	-276.57	-19.36	.00	.001	.000	358.359	15.87	-3.11	.00	-.01	17.64	4.91
107	SEABED	-280.07	-19.36	.00	.001	.000	361.859	15.87	-3.11	.00	-.05	17.69	4.93
108	SEABED	-283.57	-19.36	.00	.001	.000	365.359	15.87	-3.11	.00	-.06	17.69	4.93

STATIC PIPE COORDINATES, FORCES AND STRESSES

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	BENDING STRESSES HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
109	SEABED	-287.07	-19.36	.00	.000	.000	368.859	15.87	-3.11	.00	-.04	17.68	4.92
110	SEABED	-290.57	-19.36	.00	.000	.000	372.359	15.87	-3.11	.00	-.03	17.66	4.92
111	SEABED	-294.07	-19.36	.00	.000	.000	375.859	15.87	-3.11	.00	-.01	17.65	4.92
112	SEABED	-297.57	-19.36	.00	.000	.000	379.359	15.87	-3.11	.00	.00	17.64	4.91
113	SEABED	-301.07	-19.36	.00	.000	.000	382.859	15.87	-3.11	.00	.00	17.63	4.91
114	SEABED	-304.57	-19.36	.00	.000	.000	386.359	15.87	-3.11	.00	.00	17.63	4.91
115	SEABED	-308.07	-19.36	.00	.000	.000	389.859	15.87	-3.11	.00	.00	17.63	4.91
116	SEABED	-311.57	-19.36	.00	.000	.000	393.359	15.87	-3.11	.00	.00	17.63	4.91
117	SEABED	-315.07	-19.36	.00	.000	.000	396.859	15.87	-3.11	.00	.00	17.63	4.91

STATIC PIPE COORDINATES, FORCES AND STRESSES

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
1	LAYBARGE	78.48	6.21	.00	.19	.00	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.38	.00	.00	.00	-.01	.00	.00	.00
5	LAYBARGE	65.95	5.99	.00	.36	.00	.00	.00	-.01	.00	.00	.00
7	LAYBARGE	60.43	5.89	.00	.37	.00	.00	.00	-.02	.00	.00	.00
9	LAYBARGE	53.79	5.78	.00	.39	.00	.00	.00	-.03	.00	.00	.00
11	LAYBARGE	47.73	5.67	.00	.47	.00	.00	.00	-.03	.00	.00	.00
13	TENSIONR	38.54	5.55	.00	1.68	.00	.00	.00	294.16	.00	.00	.00
15	LAYBARGE	29.53	5.36	.00	.00	.00	.01	.00	294.15	.00	.00	.00
17	LAYBARGE	23.33	5.25	.00	1.57	.00	.00	.00	294.15	.00	.00	.00
19	LAYBARGE	17.33	5.11	.00	6.33	.00	.00	.00	294.12	.00	.00	.00
21	LAYBARGE	10.72	4.82	.00	9.54	.00	.00	.00	294.08	.00	.00	.00
24	STINGER	-.89	3.96	.00	10.42	.00	.00	.00	294.02	.00	.00	.00
26	STINGER	-8.31	3.16	.00	6.17	.00	.00	.00	294.00	.00	.00	.00
28	STINGER	-14.42	2.38	.00	9.24	.00	.00	.00	293.94	.00	.00	.00
30	STINGER	-24.80	.74	.00	7.69	-.18	.00	.00	293.85	.00	.00	.00
32	STINGER	-30.75	-.35	.00	7.86	-.73	.00	.00	293.78	.00	.00	.00
34	STINGER	-36.66	-1.59	.00	3.76	-.98	.00	.00	293.74	.00	.00	.00
36	STINGER	-41.25	-2.61	.00	11.11	-95.94	.00	.00	284.98	.00	.00	.00
38	SAGBEND	-44.55	-3.43	.83	.00	.00	.00	.00	284.41	24.24	76.64	80.38
39	SAGBEND	-47.85	-4.25	1.66	.00	.00	.00	.00	283.80	43.88	134.44	141.42
40	SAGBEND	-50.10	-4.80	2.20	.00	.00	.00	.00	283.37	55.18	165.06	174.04
41	SAGBEND	-52.36	-5.34	2.73	.00	.00	.00	.00	282.95	65.08	189.92	200.76
42	SAGBEND	-54.48	-5.85	3.21	.00	.00	.00	.00	282.56	73.42	208.78	221.31
43	SAGBEND	-57.82	-6.64	3.94	.00	.00	.00	.00	281.98	84.53	231.15	246.12
44	SAGBEND	-61.16	-7.40	4.62	.00	.00	.00	.00	281.43	93.81	246.46	263.71
45	SAGBEND	-64.52	-8.15	5.26	.00	.00	.00	.00	280.91	101.61	256.27	275.68
46	SAGBEND	-67.90	-8.88	5.84	.00	.00	.00	.00	280.42	108.17	261.82	283.29
47	SAGBEND	-71.28	-9.59	6.38	.00	.00	.00	.00	279.96	113.71	264.09	287.53
48	SAGBEND	-74.68	-10.28	6.87	.00	.00	.00	.00	279.52	118.39	263.85	289.20
49	SAGBEND	-78.09	-10.95	7.30	.00	.00	.00	.00	279.10	122.35	261.71	288.90
50	SAGBEND	-81.50	-11.59	7.69	.00	.00	.00	.00	278.71	125.69	258.15	287.12
51	SAGBEND	-84.93	-12.21	8.03	.00	.00	.00	.00	278.34	128.52	253.55	284.26
52	SAGBEND	-88.37	-12.80	8.32	.00	.00	.00	.00	277.98	130.89	248.19	280.59
53	SAGBEND	-91.81	-13.37	8.56	.00	.00	.00	.00	277.64	132.89	242.32	276.37
54	SAGBEND	-95.27	-13.92	8.76	.00	.00	.00	.00	277.33	134.54	236.11	271.75
55	SAGBEND	-98.72	-14.43	8.90	.00	.00	.00	.00	277.02	135.90	229.68	266.88
56	SAGBEND	-102.19	-14.93	9.01	.00	.00	.00	.00	276.74	136.99	223.14	261.84
57	SAGBEND	-105.66	-15.39	9.07	.00	.00	.00	.00	276.47	137.83	216.55	256.70
58	SAGBEND	-109.13	-15.83	9.09	.00	.00	.00	.00	276.21	138.44	209.94	251.48
59	SAGBEND	-112.60	-16.24	9.07	.00	.00	.00	.00	275.98	138.83	203.33	246.20
60	SAGBEND	-116.08	-16.63	9.01	.00	.00	.00	.00	275.76	138.98	196.69	240.84
61	SAGBEND	-119.56	-16.99	8.91	.00	.00	.00	.00	275.55	138.89	190.00	235.35
62	SAGBEND	-123.04	-17.32	8.77	.00	.00	.00	.00	275.37	138.53	183.17	229.66
63	SAGBEND	-126.53	-17.62	8.60	.00	.00	.00	.00	275.20	137.88	176.12	223.68

STATIC PIPE COORDINATES, FORCES AND STRESSES

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
64	SAGBEND	-130.01	-17.90	8.39	.00	.00	.00	.00	275.04	136.89	168.72	217.27
65	SAGBEND	-133.49	-18.15	8.16	.00	.00	.00	.00	274.91	135.50	160.79	210.27
66	SAGBEND	-136.97	-18.38	7.89	.00	.00	.00	.00	274.79	133.63	152.11	202.47
67	SAGBEND	-140.46	-18.58	7.59	.00	.00	.00	.00	274.70	131.18	142.40	193.61
68	SAGBEND	-143.94	-18.75	7.26	.00	.00	.00	.00	274.62	128.01	131.30	183.37
69	SAGBEND	-147.41	-18.90	6.90	.00	.00	.00	.00	274.56	123.96	118.35	171.38
70	SAGBEND	-150.89	-19.03	6.53	.00	.00	.00	.00	274.52	118.81	102.99	157.23
71	SAGBEND	-154.37	-19.13	6.13	.00	.00	.00	.00	274.49	112.29	84.49	140.52
72	SAGBEND	-157.84	-19.21	5.72	.00	.00	.00	.00	274.48	104.06	61.95	121.10
73	SAGBEND	-161.32	-19.27	5.30	.00	.00	.00	.00	274.48	93.68	34.22	99.74
74	SAGBEND	-164.79	-19.32	4.87	.00	.00	.00	.00	274.48	80.62	4.09	80.73
75	SAGBEND	-168.26	-19.34	4.44	.09	-.08	.00	.00	274.48	64.19	-25.82	69.19
76	SEABED	-171.74	-19.36	4.01	1.79	-1.79	.00	.00	274.47	43.96	-56.66	71.71
77	SEABED	-175.21	-19.36	3.59	3.35	-3.35	.00	.00	274.45	24.65	-84.30	87.83
78	SEABED	-178.69	-19.36	3.19	3.66	-3.66	.00	.00	274.43	10.69	-104.75	105.29
79	SEABED	-182.17	-19.36	2.81	3.40	-3.40	.00	.00	274.40	2.45	-117.96	117.99
80	SEABED	-185.65	-19.36	2.46	2.98	-2.98	.00	.00	274.39	-1.39	-125.54	125.55
81	SEABED	-189.13	-19.36	2.13	2.61	-2.61	.00	.00	274.38	-2.53	-129.37	129.40
82	SEABED	-192.62	-19.36	1.82	2.35	-2.35	.00	.00	274.37	-2.31	-130.94	130.96
83	SEABED	-196.11	-19.36	1.54	2.21	-2.21	.00	.00	274.37	-1.62	-131.24	131.25

84	SEABED	-199.60	-19.36	1.28	2.15	-2.15	.00	.00	274.38	-.93	-130.78	130.78
85	SEABED	-203.09	-19.36	1.05	2.14	-2.14	.00	.00	274.38	-.42	-129.75	129.75
86	SEABED	-206.59	-19.36	.84	2.14	-2.14	.00	.00	274.38	-.11	-128.17	128.17
87	SEABED	-210.08	-19.36	.66	2.16	-2.16	.00	.00	274.39	.04	-125.91	125.91
88	SEABED	-213.58	-19.36	.50	2.17	-2.17	.00	.00	274.39	.09	-122.80	122.80
89	SEABED	-217.08	-19.36	.37	2.18	-2.18	.00	.00	274.40	.08	-118.63	118.63
90	SEABED	-220.57	-19.36	.26	2.19	-2.19	.00	.00	274.41	.06	-113.14	113.14
91	SEABED	-224.07	-19.36	.17	2.19	-2.19	.00	.00	274.42	.03	-106.02	106.02
92	SEABED	-227.57	-19.36	.11	2.19	-2.19	.00	.00	274.44	.02	-96.89	96.89
93	SEABED	-231.07	-19.36	.06	2.19	-2.19	.00	.00	274.45	.00	-85.24	85.24
94	SEABED	-234.57	-19.36	.02	2.19	-2.19	.00	.00	274.47	.00	-70.47	70.47
95	SEABED	-238.07	-19.36	.01	2.19	-1.34	.00	.00	274.49	.00	-51.81	51.81
96	SEABED	-241.57	-19.36	.00	2.19	.76	.00	.00	274.50	.00	-31.32	31.32
97	SEABED	-245.07	-19.36	-.01	2.19	1.48	.00	.00	274.51	.00	-15.09	15.09
98	SEABED	-248.57	-19.36	-.01	2.19	1.36	.00	.00	274.51	.00	-4.81	4.81
99	SEABED	-252.07	-19.36	.00	2.19	.96	.00	.00	274.51	.00	.43	.43
100	SEABED	-255.57	-19.36	.00	2.19	.54	.00	.00	274.51	.00	2.33	2.33
101	SEABED	-259.07	-19.36	.00	2.19	.24	.00	.00	274.51	.00	2.45	2.45
102	SEABED	-262.57	-19.36	.00	2.19	.06	.00	.00	274.51	.00	1.84	1.84
103	SEABED	-266.07	-19.36	.00	2.19	-.03	.00	.00	274.51	.00	1.11	1.11
104	SEABED	-269.57	-19.36	.00	2.19	-.05	.00	.00	274.51	.00	.54	.54
105	SEABED	-273.07	-19.36	.00	2.19	-.05	.00	.00	274.51	.00	.17	.17
106	SEABED	-276.57	-19.36	.00	2.19	-.03	.00	.00	274.51	.00	-.01	.01
107	SEABED	-280.07	-19.36	.00	2.19	-.02	.00	.00	274.51	.00	-.08	.08
108	SEABED	-283.57	-19.36	.00	2.19	-.01	.00	.00	274.51	.00	-.09	.09

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
109	SEABED	-287.07	-19.36	.00	2.19	.00	.00	.00	274.51	.00	-.07	.07
110	SEABED	-290.57	-19.36	.00	2.19	.00	.00	.00	274.51	.00	-.04	.04
111	SEABED	-294.07	-19.36	.00	2.19	.00	.00	.00	274.51	.00	-.02	.02
112	SEABED	-297.57	-19.36	.00	2.19	.00	.00	.00	274.51	.00	-.01	.01
113	SEABED	-301.07	-19.36	.00	2.19	.00	.00	.00	274.51	.00	.00	.00
114	SEABED	-304.57	-19.36	.00	2.19	.00	.00	.00	274.51	.00	.00	.00
115	SEABED	-308.07	-19.36	.00	2.19	.00	.00	.00	274.51	.00	.00	.00
116	SEABED	-311.57	-19.36	.00	2.19	.00	.00	.00	274.51	.00	.00	.00
117	SEABED	-315.07	-19.36	.00	.00	.00	.00	.00	274.51	.00	.00	.00

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	BENDING STRESSES HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
1	LAYBARGE	78.48	6.21	.00	.000	.991	.000	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.000	.997	6.361	.00	.00	.00	.00	.00	.00
5	LAYBARGE	65.95	5.99	.00	.000	1.005	12.532	.00	.00	.00	.00	.00	.00
7	LAYBARGE	60.43	5.89	.00	.000	1.004	18.053	.00	.00	.00	.00	.00	.00
9	LAYBARGE	53.79	5.78	.00	.000	1.001	24.694	.00	.00	.00	.00	.00	.00
11	LAYBARGE	47.73	5.67	.00	.000	.875	30.755	.00	.00	.00	.00	.00	.00
13	TENSIONR	38.54	5.55	.00	.000	.967	39.945	.00	.00	.00	.00	.00	.00
15	LAYBARGE	29.53	5.36	.00	.000	1.140	48.958	.00	.00	.00	.00	.00	.00
17	LAYBARGE	23.33	5.25	.00	.000	1.212	55.159	.00	.00	.00	.00	.00	.00
19	LAYBARGE	17.33	5.11	.00	.000	1.907	61.160	.00	.00	.00	.00	.00	.00
21	LAYBARGE	10.72	4.82	.00	-.001	3.361	67.777	.00	.00	.00	.00	.00	.00
24	STINGER	-.89	3.96	.00	-.001	5.195	79.419	.00	.00	.00	.00	.00	.00
26	STINGER	-8.31	3.16	.00	.000	6.714	86.882	.00	.00	.00	.00	.00	.00
28	STINGER	-14.42	2.38	.00	-.001	8.127	93.042	.00	.00	.00	.00	.00	.00
30	STINGER	-24.80	.74	.00	.000	9.680	103.551	.00	.00	.00	.00	.00	.00
32	STINGER	-30.75	-.35	.00	.000	11.115	109.600	.00	.00	.00	.00	.00	.00
34	STINGER	-36.66	-1.59	.00	-.001	12.189	115.639	.00	.00	.00	.00	.00	.00
36	STINGER	-41.25	-2.61	.00	-5.471	12.502	120.344	.00	.00	.00	.00	.00	.00
38	SAGBEND	-44.42	-3.32	.61	-10.884	12.358	123.646	.00	.00	.00	.00	.00	.00
39	SAGBEND	-47.58	-4.02	1.22	-10.783	12.328	126.946	.00	.00	.00	.00	.00	.00
40	SAGBEND	-50.75	-4.73	1.82	-10.685	12.299	130.246	.00	.00	.00	.00	.00	.00
41	SAGBEND	-53.92	-5.43	2.41	-10.590	12.269	133.546	.00	.00	.00	.00	.00	.00
42	SAGBEND	-57.09	-6.13	3.00	-10.497	12.238	136.846	.00	.00	.00	.00	.00	.00
43	SAGBEND	-60.26	-6.83	3.59	-10.395	12.201	140.146	.00	.00	.00	.00	.00	.00
44	SAGBEND	-63.43	-7.52	4.17	-10.223	12.131	143.446	.00	.00	.00	.00	.00	.00
45	SAGBEND	-66.61	-8.22	4.74	-9.629	11.871	146.746	.00	.00	.00	.00	.00	.00
46	SAGBEND	-69.79	-8.90	5.29	-6.572	10.480	150.046	17.89	-1.43	2.20	4.67	23.81	6.63
47	SAGBEND	-73.01	-9.50	5.66	-6.467	10.431	153.346	17.82	-1.53	18.98	39.55	62.46	17.40
48	SAGBEND	-76.24	-10.10	6.02	-6.223	10.315	156.646	17.74	-1.62	32.51	66.21	92.32	25.72
49	SAGBEND	-79.47	-10.68	6.37	-5.872	10.143	159.946	17.66	-1.72	43.44	86.36	115.21	32.09
50	SAGBEND	-82.70	-11.26	6.69	-5.442	9.928	163.246	17.59	-1.81	52.31	101.36	132.56	36.93
51	SAGBEND	-85.94	-11.82	6.98	-4.953	9.676	166.546	17.52	-1.90	59.52	112.28	145.56	40.55
52	SAGBEND	-89.18	-12.37	7.25	-4.422	9.395	169.846	17.45	-1.99	65.38	120.00	155.11	43.21
53	SAGBEND	-92.43	-12.90	7.48	-3.863	9.091	173.146	17.38	-2.07	70.17	125.19	161.94	45.11
54	SAGBEND	-95.69	-13.41	7.69	-3.285	8.767	176.446	17.31	-2.16	74.07	128.42	166.65	46.42
55	SAGBEND	-98.94	-13.90	7.86	-2.697	8.427	179.746	17.25	-2.24	77.24	130.10	169.68	47.27
56	SAGBEND	-102.21	-14.38	7.99	-2.104	8.074	183.046	17.19	-2.31	79.82	130.58	171.41	47.75
57	SAGBEND	-105.47	-14.83	8.10	-1.512	7.711	186.346	17.14	-2.38	81.91	130.14	172.11	47.94
58	SAGBEND	-108.74	-15.26	8.17	-.924	7.339	189.646	17.08	-2.45	83.59	128.97	172.01	47.92
59	SAGBEND	-112.02	-15.67	8.20	-.343	6.961	192.946	17.03	-2.52	84.92	127.24	171.29	47.71
60	SAGBEND	-115.30	-16.06	8.20	.228	6.577	196.246	16.99	-2.58	85.95	125.08	170.05	47.37
61	SAGBEND	-118.58	-16.43	8.18	.788	6.189	199.546	16.94	-2.64	86.71	122.55	168.41	46.91
62	SAGBEND	-121.86	-16.77	8.11	1.336	5.798	202.846	16.90	-2.70	87.24	119.73	166.41	46.35
63	SAGBEND	-125.14	-17.09	8.02	1.870	5.406	206.146	16.86	-2.75	87.55	116.63	164.08	45.71

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	BENDING STRESSES HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
64	SAGBEND	-128.42	-17.39	7.90	2.389	5.012	209.446	16.83	-2.80	87.63	113.25	161.44	44.97
65	SAGBEND	-131.71	-17.67	7.75	2.892	4.619	212.746	16.79	-2.84	87.50	109.58	158.46	44.14
66	SAGBEND	-134.99	-17.93	7.57	3.377	4.226	216.046	16.76	-2.88	87.14	105.56	155.10	43.20
67	SAGBEND	-138.28	-18.16	7.36	3.843	3.836	219.346	16.74	-2.92	86.52	101.11	151.29	42.14
68	SAGBEND	-141.56	-18.37	7.13	4.287	3.449	222.646	16.71	-2.95	85.61	96.12	146.93	40.93
69	SAGBEND	-144.85	-18.55	6.87	4.708	3.067	225.946	16.69	-2.98	84.36	90.46	141.89	39.52
70	SAGBEND	-148.13	-18.72	6.59	5.101	2.691	229.246	16.67	-3.01	82.71	83.91	136.03	37.89
71	SAGBEND	-151.42	-18.86	6.28	5.461	2.324	232.546	16.66	-3.03	80.59	76.24	129.14	35.97
72	SAGBEND	-154.70	-18.99	5.96	5.784	1.968	235.846	16.64	-3.05	77.87	67.15	121.02	33.71
73	SAGBEND	-157.98	-19.09	5.62	6.063	1.625	239.146	16.63	-3.07	74.44	56.22	111.49	31.05
74	SAGBEND	-161.26	-19.18	5.26	6.287	1.300	242.446	16.62	-3.08	70.13	42.98	100.45	27.98
75	SAGBEND	-164.54	-19.24	4.90	6.445	.997	245.746	16.62	-3.09	64.72	26.80	88.25	24.58
76	SAGBEND	-167.81	-19.29	4.53	6.526	.720	249.046	16.61	-3.10	57.95	9.43	76.92	21.43
77	SAGBEND	-171.09	-19.33	4.15	6.530	.478	252.346	16.61	-3.11	49.50	-7.48	68.28	19.02
78	SAGBEND	-174.37	-19.35	3.78	6.458	.279	255.646	16.61	-3.11	38.94	-24.75	64.36	17.93
79	SEABED	-177.65	-19.36	3.41	6.306	.131	258.946	16.61	-3.11	26.36	-42.64	68.35	19.04
80	SEABED	-180.93	-19.36	3.05	6.078	.040	262.246	16.60	-3.11	14.91	-58.27	78.35	21.83
81	SEABED	-184.21	-19.36	2.71	5.789	-.007	265.546	16.60	-3.11	6.65	-69.78	88.29	24.59
82	SEABED	-187.50	-19.36	2.39	5.457	-.025	268.846	16.60	-3.11	1.67	-77.24	95.45	26.59
83	SEABED	-190.78	-19.36	2.08	5.099	-.026	272.146	16.60	-3.11	-.77	-81.53	99.72	27.78
84	SEABED	-194.07	-19.36	1.80	4.727	-.021	275.446	16.60	-3.11	-1.59	-83.63	101.84	28.37
85	SEABED	-197.36	-19.36	1.54	4.349	-.013	278.746	16.60	-3.11	-1.55	-84.39	102.59	28.58
86	SEABED	-200.65	-19.36	1.30	3.970	-.007	282.046	16.60	-3.11	-1.16	-84.35	102.55	28.56
87	SEABED	-203.95	-19.36	1.08	3.591	-.003	285.346	16.60	-3.11	-.73	-83.82	102.02	28.42
88	SEABED	-207.24	-19.36	.89	3.216	.000	288.646	16.60	-3.11	-.37	-82.94	101.14	28.17
89	SEABED	-210.54	-19.36	.71	2.846	.001	291.946	16.60	-3.11	-.14	-81.72	99.91	27.83
90	SEABED	-213.83	-19.36	.56	2.482	.001	295.246	16.60	-3.11	-.01	-80.08	98.28	27.38
91	SEABED	-217.13	-19.36	.43	2.127	.001	298.546	16.60	-3.11	.04	-77.93	96.13	26.78
92	SEABED	-220.43	-19.36	.31	1.783	.001	301.846	16.60	-3.11	.06	-75.14	93.34	26.00
93	SEABED	-223.73	-19.36	.22	1.453	.000	305.146	16.60	-3.11	.05	-71.53	89.73	24.99
94	SEABED	-227.03	-19.36	.15	1.141	.000	308.446	16.60	-3.11	.03	-66.92	85.13	23.71
95	SEABED	-230.32	-19.36	.09	.853	.000	311.746	16.60	-3.11	.02	-61.08	79.28	22.08
96	SEABED	-233.62	-19.36	.05	.594	.000	315.046	16.61	-3.11	.01	-53.70	71.91	20.03
97	SEABED	-236.92	-19.36	.02	.373	.000	318.346	16.61	-3.11	.00	-44.42	62.64	17.45
98	SEABED	-240.22	-19.36	.00	.198	.000	321.646	16.61	-3.11	.00	-32.82	51.05	14.22
99	SEABED	-243.52	-19.36	.00	.079	.000	324.945	16.61	-3.11	.00	-20.33	38.59	10.75
100	SEABED	-246.82	-19.36	-.01	.012	.000	328.246	16.61	-3.11	.00	-10.31	28.60	7.97
101	SEABED	-250.12	-19.36	-.01	-.019	.000	331.546	16.61	-3.11	.00	-3.73	22.06	6.15
102	SEABED	-253.42	-19.36	.00	-.026	.000	334.846	16.61	-3.11	.00	-.15	18.51	5.16
103	SEABED	-256.72	-19.36	.00	-.023	.000	338.146	16.61	-3.11	.00	1.34	19.69	5.49
104	SEABED	-260.02	-19.36	.00	-.016	.000	341.446	16.61	-3.11	.00	1.62	19.97	5.56
105	SEABED	-263.32	-19.36	.00	-.009	.000	344.746	16.61	-3.11	.00	1.34	19.69	5.49
106	SEABED	-266.62	-19.36	.00	-.004	.000	348.046	16.61	-3.11	.00	.90	19.26	5.36
107	SEABED	-269.92	-19.36	.00	-.001	.000	351.346	16.61	-3.11	.00	.50	18.86	5.25
108	SEABED	-273.22	-19.36	.00	.000	.000	354.646	16.61	-3.11	.00	.22	18.58	5.18

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	BENDING STRESSES HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
109	SEABED	-276.52	-19.36	.00	.001	.000	357.946	16.61	-3.11	.00	.05	18.41	5.13
110	SEABED	-279.82	-19.36	.00	.001	.000	361.246	16.61	-3.11	.00	-.03	18.39	5.12
111	SEABED	-283.12	-19.36	.00	.001	.000	364.546	16.61	-3.11	.00	-.06	18.42	5.13
112	SEABED	-286.42	-19.36	.00	.000	.000	367.846	16.61	-3.11	.00	-.05	18.42	5.13
113	SEABED	-289.72	-19.36	.00	.000	.000	371.146	16.61	-3.11	.00	-.04	18.40	5.13
114	SEABED	-293.02	-19.36	.00	.000	.000	374.446	16.61	-3.11	.00	-.02	18.39	5.12
115	SEABED	-296.32	-19.36	.00	.000	.000	377.746	16.61	-3.11	.00	-.01	18.38	5.12
116	SEABED	-299.62	-19.36	.00	.000	.000	381.046	16.61	-3.11	.00	.00	18.37	5.12
117	SEABED	-302.92	-19.36	.00	.000	.000	384.346	16.61	-3.11	.00	.00	18.36	5.12
118	SEABED	-306.22	-19.36	.00	.000	.000	387.646	16.61	-3.11	.00	.00	18.36	5.12
119	SEABED	-309.52	-19.36	.00	.000	.000	390.946	16.61	-3.11	.00	.00	18.36	5.12
120	SEABED	-312.82	-19.36	.00	.000	.000	394.246	16.61	-3.11	.00	.00	18.36	5.12

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
1	LAYBARGE	78.48	6.21	.00	.19	.00	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.38	.00	.00	.00	-.01	.00	.00	.00
5	LAYBARGE	65.95	5.99	.00	.36	.00	.00	.00	-.01	.00	.00	.00
7	LAYBARGE	60.43	5.89	.00	.37	.00	.00	.00	-.02	.00	.00	.00
9	LAYBARGE	53.79	5.78	.00	.39	.00	.00	.00	-.03	.00	.00	.00
11	LAYBARGE	47.73	5.67	.00	.47	.00	.00	.00	-.03	.00	.00	.00
13	TENSIONR	38.54	5.55	.00	1.68	.00	.00	.00	294.16	.00	.00	.00
15	LAYBARGE	29.53	5.36	.00	.00	.00	.01	.00	294.15	.00	.00	.00
17	LAYBARGE	23.33	5.25	.00	1.57	.00	.00	.00	294.14	.00	.00	.00
19	LAYBARGE	17.33	5.11	.00	6.33	.00	.00	.00	294.12	.00	.00	.00
21	LAYBARGE	10.72	4.82	.00	9.54	.00	.00	.00	294.08	.00	.00	.00
24	STINGER	-.89	3.96	.00	10.42	.00	.00	.00	294.02	.00	.00	.00
26	STINGER	-8.31	3.16	.00	6.17	.00	.00	.00	294.00	.00	.00	.00
28	STINGER	-14.42	2.38	.00	9.24	.00	.00	.00	293.93	.00	.00	.00
30	STINGER	-24.80	.74	.00	7.69	-.18	.00	.00	293.84	.00	.00	.00
32	STINGER	-30.75	-.35	.00	7.86	-.73	.00	.00	293.78	.00	.00	.00
34	STINGER	-36.66	-1.59	.00	3.76	-.97	.00	.00	293.73	.00	.00	.00
36	STINGER	-41.25	-2.61	.00	-.61	-55.31	.00	.00	292.38	.00	.00	.00
38	SAGBEND	-44.42	-3.32	.61	.00	.00	.00	.00	293.63	.00	.00	.00
39	SAGBEND	-47.58	-4.02	1.22	.00	.00	.00	.00	293.59	.00	.00	.00
40	SAGBEND	-50.75	-4.73	1.82	.00	.00	.00	.00	293.56	.00	.00	.00

41	SAGBEND	-53.92	-5.43	2.41	.00	.00	.00	.00	293.52	.00	.00	.00
42	SAGBEND	-57.09	-6.13	3.00	.00	.00	.00	.00	293.48	.00	.01	.00
43	SAGBEND	-60.26	-6.83	3.59	.00	.00	.00	.00	293.45	.02	.04	.00
44	SAGBEND	-63.43	-7.52	4.17	.00	.00	.00	.00	293.41	.09	.21	.00
45	SAGBEND	-66.61	-8.22	4.74	.00	.00	.00	.00	293.35	.55	1.21	.00
46	SAGBEND	-69.79	-8.90	5.29	.00	.00	.00	.00	292.66	3.30	7.01	7.74
47	SAGBEND	-73.01	-9.50	5.66	.00	.00	.00	.00	292.25	28.46	59.29	65.77
48	SAGBEND	-76.24	-10.10	6.02	.00	.00	.00	.00	291.81	48.74	99.27	110.59
49	SAGBEND	-79.47	-10.68	6.37	.00	.00	.00	.00	291.38	65.13	129.49	144.94
50	SAGBEND	-82.70	-11.26	6.69	.00	.00	.00	.00	290.95	78.43	151.97	171.01
51	SAGBEND	-85.94	-11.82	6.98	.00	.00	.00	.00	290.55	89.23	168.35	190.53
52	SAGBEND	-89.18	-12.37	7.25	.00	.00	.00	.00	290.16	98.03	179.92	204.89
53	SAGBEND	-92.43	-12.90	7.48	.00	.00	.00	.00	289.79	105.20	187.70	215.18
54	SAGBEND	-95.69	-13.41	7.69	.00	.00	.00	.00	289.45	111.05	192.53	222.26
55	SAGBEND	-98.94	-13.90	7.86	.00	.00	.00	.00	289.12	115.81	195.05	226.84
56	SAGBEND	-102.21	-14.38	7.99	.00	.00	.00	.00	288.82	119.68	195.78	229.46
57	SAGBEND	-105.47	-14.83	8.10	.00	.00	.00	.00	288.53	122.81	195.11	230.55
58	SAGBEND	-108.74	-15.26	8.17	.00	.00	.00	.00	288.26	125.33	193.36	230.43
59	SAGBEND	-112.02	-15.67	8.20	.00	.00	.00	.00	288.01	127.32	190.78	229.36
60	SAGBEND	-115.30	-16.06	8.20	.00	.00	.00	.00	287.77	128.86	187.53	227.54
61	SAGBEND	-118.58	-16.43	8.18	.00	.00	.00	.00	287.55	130.01	183.75	225.09
62	SAGBEND	-121.86	-16.77	8.11	.00	.00	.00	.00	287.35	130.80	179.51	222.11
63	SAGBEND	-125.14	-17.09	8.02	.00	.00	.00	.00	287.16	131.26	174.86	218.64

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
64	SAGBEND	-128.42	-17.39	7.90	.00	.00	.00	.00	286.98	131.39	169.80	214.69
65	SAGBEND	-131.71	-17.67	7.75	.00	.00	.00	.00	286.82	131.19	164.29	210.24
66	SAGBEND	-134.99	-17.93	7.57	.00	.00	.00	.00	286.68	130.64	158.26	205.22
67	SAGBEND	-138.28	-18.16	7.36	.00	.00	.00	.00	286.56	129.71	151.59	199.51
68	SAGBEND	-141.56	-18.37	7.13	.00	.00	.00	.00	286.44	128.35	144.12	192.99
69	SAGBEND	-144.85	-18.55	6.87	.00	.00	.00	.00	286.35	126.48	135.62	185.45
70	SAGBEND	-148.13	-18.72	6.59	.00	.00	.00	.00	286.27	124.01	125.81	176.65
71	SAGBEND	-151.42	-18.86	6.28	.00	.00	.00	.00	286.21	120.82	114.31	166.33
72	SAGBEND	-154.70	-18.99	5.96	.00	.00	.00	.00	286.16	116.76	100.67	154.16
73	SAGBEND	-157.98	-19.09	5.62	.00	.00	.00	.00	286.13	111.61	84.29	139.87
74	SAGBEND	-161.26	-19.18	5.26	.00	.00	.00	.00	286.11	105.14	64.44	123.32
75	SAGBEND	-164.54	-19.24	4.90	.00	.00	.00	.00	286.11	97.03	40.18	105.02
76	SAGBEND	-167.81	-19.29	4.53	.00	.00	.00	.00	286.10	86.88	14.13	88.03
77	SAGBEND	-171.09	-19.33	4.15	.00	.00	.00	.00	286.10	74.21	-11.21	75.05
78	SAGBEND	-174.37	-19.35	3.78	.23	-.23	.00	.00	286.09	58.39	-37.11	69.18
79	SEABED	-177.65	-19.36	3.41	2.01	-2.01	.00	.00	286.08	39.52	-63.93	75.16
80	SEABED	-180.93	-19.36	3.05	3.19	-3.19	.00	.00	286.06	22.35	-87.36	90.17
81	SEABED	-184.21	-19.36	2.71	3.41	-3.40	.00	.00	286.04	9.97	-104.62	105.09
82	SEABED	-187.50	-19.36	2.39	3.17	-3.17	.00	.00	286.02	2.51	-115.81	115.83
83	SEABED	-190.78	-19.36	2.08	2.81	-2.81	.00	.00	286.01	-1.15	-122.23	122.24
84	SEABED	-194.07	-19.36	1.80	2.49	-2.49	.00	.00	286.00	-2.38	-125.39	125.41
85	SEABED	-197.36	-19.36	1.54	2.25	-2.25	.00	.00	286.00	-2.32	-126.52	126.54
86	SEABED	-200.65	-19.36	1.30	2.11	-2.11	.00	.00	286.00	-1.74	-126.46	126.47
87	SEABED	-203.95	-19.36	1.08	2.04	-2.04	.00	.00	286.00	-1.09	-125.67	125.68
88	SEABED	-207.24	-19.36	.89	2.02	-2.02	.00	.00	286.00	-.56	-124.36	124.36
89	SEABED	-210.54	-19.36	.71	2.02	-2.02	.00	.00	286.00	-.21	-122.52	122.52
90	SEABED	-213.83	-19.36	.56	2.03	-2.03	.00	.00	286.01	-.02	-120.07	120.07
91	SEABED	-217.13	-19.36	.43	2.04	-2.04	.00	.00	286.02	.07	-116.85	116.85
92	SEABED	-220.43	-19.36	.31	2.05	-2.05	.00	.00	286.02	.09	-112.65	112.65
93	SEABED	-223.73	-19.36	.22	2.06	-2.06	.00	.00	286.03	.07	-107.25	107.25
94	SEABED	-227.03	-19.36	.15	2.06	-2.06	.00	.00	286.04	.05	-100.34	100.34
95	SEABED	-230.32	-19.36	.09	2.06	-2.06	.00	.00	286.06	.03	-91.57	91.57
96	SEABED	-233.62	-19.36	.05	2.06	-2.06	.00	.00	286.07	.01	-80.51	80.51
97	SEABED	-236.92	-19.36	.02	2.06	-2.06	.00	.00	286.09	.00	-66.60	66.60
98	SEABED	-240.22	-19.36	.00	2.06	-1.16	.00	.00	286.10	.00	-49.21	49.21
99	SEABED	-243.52	-19.36	.00	2.06	.68	.00	.00	286.11	.00	-30.48	30.48
100	SEABED	-246.82	-19.36	-.01	2.06	1.34	.00	.00	286.12	.00	-15.46	15.46
101	SEABED	-250.12	-19.36	-.01	2.06	1.28	.00	.00	286.12	.00	-5.60	5.60
102	SEABED	-253.42	-19.36	.00	2.06	.94	.00	.00	286.12	.00	-.23	.23
103	SEABED	-256.72	-19.36	.00	2.06	.58	.00	.00	286.12	.00	2.01	2.01
104	SEABED	-260.02	-19.36	.00	2.06	.29	.00	.00	286.12	.00	2.43	2.43
105	SEABED	-263.32	-19.36	.00	2.06	.10	.00	.00	286.12	.00	2.01	2.01
106	SEABED	-266.62	-19.36	.00	2.06	.00	.00	.00	286.12	.00	1.35	1.35
107	SEABED	-269.92	-19.36	.00	2.06	-.04	.00	.00	286.12	.00	.75	.75
108	SEABED	-273.22	-19.36	.00	2.06	-.05	.00	.00	286.12	.00	.33	.33

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
109	SEABED	-276.52	-19.36	.00	2.06	-.04	.00	.00	286.12	.00	.08	.08
110	SEABED	-279.82	-19.36	.00	2.06	-.03	.00	.00	286.12	.00	-.05	.05
111	SEABED	-283.12	-19.36	.00	2.06	-.01	.00	.00	286.12	.00	-.08	.08
112	SEABED	-286.42	-19.36	.00	2.06	-.01	.00	.00	286.12	.00	-.08	.08
113	SEABED	-289.72	-19.36	.00	2.06	.00	.00	.00	286.12	.00	-.06	.06
114	SEABED	-293.02	-19.36	.00	2.06	.00	.00	.00	286.12	.00	-.04	.04
115	SEABED	-296.32	-19.36	.00	2.06	.00	.00	.00	286.12	.00	-.02	.02
116	SEABED	-299.62	-19.36	.00	2.06	.00	.00	.00	286.12	.00	-.01	.01
117	SEABED	-302.92	-19.36	.00	2.06	.00	.00	.00	286.12	.00	.00	.00
118	SEABED	-306.22	-19.36	.00	2.06	.00	.00	.00	286.12	.00	.00	.00
119	SEABED	-309.52	-19.36	.00	2.06	.00	.00	.00	286.12	.00	.00	.00
120	SEABED	-312.82	-19.36	.00	.00	.00	.00	.00	286.12	.00	.00	.00

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
1	LAYBARGE	78.48	6.21	.00	.000	.991	.000	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.000	.997	6.361	.00	.00	.00	.00	.00	.00
5	LAYBARGE	65.95	5.99	.00	.000	1.005	12.532	.00	.00	.00	.00	.00	.00
7	LAYBARGE	60.43	5.89	.00	.000	1.004	18.053	.00	.00	.00	.00	.00	.00
9	LAYBARGE	53.79	5.78	.00	.000	1.001	24.694	.00	.00	.00	.00	.00	.00
11	LAYBARGE	47.73	5.67	.00	.000	.875	30.755	.00	.00	.00	.00	.00	.00
13	TENSIONR	38.54	5.55	.00	.000	.967	39.945	.00	.00	.00	.00	.00	.00
15	LAYBARGE	29.53	5.36	.00	.000	1.140	48.958	.00	.00	.00	.00	.00	.00
17	LAYBARGE	23.33	5.25	.00	.000	1.212	55.159	.00	.00	.00	.00	.00	.00
19	LAYBARGE	17.33	5.11	.00	.000	1.907	61.160	.00	.00	.00	.00	.00	.00
21	LAYBARGE	10.72	4.82	.00	.000	3.361	67.777	.00	.00	.00	.00	.00	.00
24	STINGER	-.89	3.96	.00	.000	5.195	79.419	.00	.00	.00	.00	.00	.00
26	STINGER	-8.31	3.16	.00	.000	6.714	86.882	.00	.00	.00	.00	.00	.00
28	STINGER	-14.42	2.38	.00	.000	8.127	93.042	.00	.00	.00	.00	.00	.00
30	STINGER	-24.80	.74	.00	.000	9.680	103.551	.00	.00	.00	.00	.00	.00
32	STINGER	-30.75	-.35	.00	.000	10.460	109.600	.00	.00	.00	.00	.00	.00
34	STINGER	-36.69	-1.45	.00	.002	10.512	115.639	.00	.00	.00	.00	.00	.00
36	STINGER	-41.31	-2.31	.00	-3.509	10.435	120.342	.00	.00	.00	.00	.00	.00
38	SAGBEND	-44.73	-2.94	.42	-6.963	10.332	123.843	.00	.00	.00	.00	.00	.00
39	SAGBEND	-48.15	-3.57	.83	-6.851	10.299	127.343	.00	.00	.00	.00	.00	.00
40	SAGBEND	-51.57	-4.19	1.24	-6.744	10.266	130.843	.00	.00	.00	.00	.00	.00
41	SAGBEND	-54.99	-4.81	1.64	-6.639	10.232	134.343	.00	.00	.00	.00	.00	.00
42	SAGBEND	-58.41	-5.43	2.04	-6.538	10.198	137.843	.00	.00	.00	.00	.00	.00
43	SAGBEND	-61.83	-6.05	2.43	-6.441	10.165	141.343	.00	.00	.00	.00	.00	.00
44	SAGBEND	-65.26	-6.67	2.81	-6.346	10.131	144.843	.00	.00	.00	.00	.00	.00
45	SAGBEND	-68.68	-7.28	3.19	-6.255	10.097	148.343	.00	.00	.00	.00	.00	.00
46	SAGBEND	-72.11	-7.90	3.56	-6.167	10.063	151.843	.00	.00	.00	.00	.00	.00
47	SAGBEND	-75.53	-8.51	3.93	-6.081	10.028	155.343	.00	.00	.00	.00	.00	.00
48	SAGBEND	-78.96	-9.12	4.29	-5.999	9.994	158.843	.00	.00	.00	.00	.00	.00
49	SAGBEND	-82.39	-9.72	4.65	-5.920	9.960	162.343	.00	.00	.00	.00	.00	.00
50	SAGBEND	-85.82	-10.33	5.00	-5.841	9.924	165.843	.00	.00	.00	.00	.00	.00
51	SAGBEND	-89.25	-10.93	5.35	-5.756	9.882	169.343	.00	.00	.00	.00	.00	.00
52	SAGBEND	-92.68	-11.53	5.70	-5.615	9.807	172.843	.00	.00	.00	.00	.00	.00
53	SAGBEND	-96.11	-12.12	6.03	-5.138	9.532	176.343	.00	.00	.00	.00	.00	.00
54	SAGBEND	-99.55	-12.71	6.35	-2.697	8.084	179.843	17.58	-2.04	2.41	3.98	23.32	6.50
55	SAGBEND	-103.01	-13.20	6.52	-2.603	8.028	183.343	17.51	-2.12	20.63	33.52	57.96	16.15
56	SAGBEND	-106.47	-13.69	6.67	-2.386	7.894	186.843	17.45	-2.20	35.03	55.83	84.48	23.53
57	SAGBEND	-109.94	-14.16	6.80	-2.075	7.699	190.343	17.39	-2.28	46.42	72.48	104.61	29.14
58	SAGBEND	-111.68	-14.40	6.86	-1.891	7.582	192.104	17.36	-2.31	51.23	79.10	112.77	31.41
59	SAGBEND	-114.28	-14.74	6.94	-1.592	7.388	194.723	17.31	-2.37	57.40	87.16	122.89	34.23
60	SAGBEND	-116.87	-15.07	7.01	-1.266	7.173	197.343	17.27	-2.42	62.60	93.40	130.94	36.47
61	SAGBEND	-120.35	-15.50	7.07	-.802	6.861	200.843	17.22	-2.49	68.24	99.43	139.08	38.74
62	SAGBEND	-123.82	-15.90	7.10	-.314	6.525	204.343	17.17	-2.56	72.67	103.34	144.80	40.33
63	SAGBEND	-127.30	-16.29	7.11	.187	6.170	207.843	17.12	-2.62	76.13	105.58	148.61	41.40

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
64	SAGBEND	-130.78	-16.66	7.08	.696	5.801	211.343	17.07	-2.68	78.79	106.49	150.90	42.03
65	SAGBEND	-134.26	-17.00	7.02	1.207	5.421	214.843	17.03	-2.73	80.78	106.33	151.95	42.33
66	SAGBEND	-137.75	-17.32	6.93	1.714	5.032	218.343	16.99	-2.78	82.21	105.27	151.97	42.33
67	SAGBEND	-141.23	-17.61	6.81	2.213	4.638	221.843	16.95	-2.83	83.13	103.44	151.09	42.09
68	SAGBEND	-144.72	-17.88	6.66	2.702	4.241	225.343	16.92	-2.88	83.60	100.87	149.39	41.61
69	SAGBEND	-148.21	-18.13	6.49	3.177	3.842	228.843	16.89	-2.92	83.64	97.58	146.89	40.92
70	SAGBEND	-151.69	-18.35	6.28	3.634	3.444	232.343	16.87	-2.95	83.23	93.50	143.54	39.98
71	SAGBEND	-155.18	-18.55	6.04	4.069	3.049	235.843	16.84	-2.98	82.36	88.54	139.28	38.80
72	SAGBEND	-158.67	-18.73	5.78	4.477	2.660	239.343	16.82	-3.01	80.97	82.51	133.95	37.31
73	SAGBEND	-162.15	-18.88	5.50	4.854	2.278	242.843	16.81	-3.04	78.98	75.17	127.38	35.48
74	SAGBEND	-165.64	-19.00	5.19	5.192	1.908	246.343	16.79	-3.06	76.28	66.18	119.34	33.24
75	SAGBEND	-169.12	-19.11	4.87	5.482	1.552	249.843	16.78	-3.07	72.73	55.11	109.60	30.53
76	SAGBEND	-172.60	-19.19	4.52	5.714	1.216	253.343	16.77	-3.09	68.12	41.40	98.06	27.32
77	SAGBEND	-176.08	-19.26	4.17	5.872	.905	256.843	16.77	-3.10	62.19	24.30	85.13	23.71
78	SAGBEND	-179.56	-19.31	3.81	5.943	.626	260.343	16.76	-3.10	54.64	5.74	73.30	20.42
79	SAGBEND	-183.05	-19.34	3.45	5.927	.387	263.843	16.76	-3.11	45.02	-12.51	65.10	18.13
80	SEABED	-186.53	-19.35	3.09	5.823	.201	267.343	16.76	-3.11	32.84	-31.42	63.82	17.78
81	SEABED	-190.01	-19.36	2.74	5.628	.076	270.843	16.76	-3.11	19.78	-49.67	71.82	20.01
82	SEABED	-193.49	-19.36	2.40	5.356	.008	274.343	16.75	-3.11	9.53	-63.89	82.95	23.11
83	SEABED	-196.98	-19.36	2.09	5.026	-.021	277.843	16.75	-3.11	3.06	-73.35	91.76	25.56
84	SEABED	-200.47	-19.36	1.79	4.662	-.027	281.343	16.75	-3.11	-.26	-78.82	97.17	27.07
85	SEABED	-203.96	-19.36	1.52	4.279	-.022	284.843	16.75	-3.11	-1.48	-81.49	99.85	27.81
86	SEABED	-207.45	-19.36	1.27	3.888	-.014	288.343	16.75	-3.11	-1.57	-82.40	100.76	28.07
87	SEABED	-210.94	-19.36	1.04	3.495	-.008	291.843	16.75	-3.11	-1.19	-82.26	100.61	28.03
88	SEABED	-214.43	-19.36	.84	3.105	-.003	295.343	16.75	-3.11	-.74	-81.47	99.82	27.80
89	SEABED	-217.93	-19.36	.66	2.719	.000	298.843	16.75	-3.11	-.37	-80.18	98.52	27.44
90	SEABED	-221.43	-19.36	.51	2.341	.001	302.343	16.75	-3.11	-.13	-78.37	96.72	26.94
91	SEABED	-224.92	-19.36	.38	1.973	.001	305.843	16.75	-3.11	.00	-75.96	94.31	26.27
92	SEABED	-228.42	-19.36	.27	1.618	.001	309.343	16.75	-3.11	.05	-72.76	91.11	25.38
93	SEABED	-231.92	-19.36	.18	1.280	.001	312.843	16.75	-3.11	.06	-68.58	86.93	24.22
94	SEABED	-235.42	-19.36	.11	.966	.000	316.343	16.76	-3.11	.04	-63.15	81.50	22.70
95	SEABED	-238.92	-19.36	.06	.681	.000	319.843	16.76	-3.11	.03	-56.14	74.50	20.75
96	SEABED	-242.42	-19.36	.03	.433	.000	323.343	16.76	-3.11	.01	-47.17	65.54	18.26
97	SEABED	-245.92	-19.36	.01	.235	.000	326.843	16.76	-3.11	.01	-35.71	54.09	15.07
98	SEABED	-249.42	-19.36	.00	.096	.000	330.343	16.76	-3.11	.00	-22.38	40.79	11.36
99	SEABED	-252.92	-19.36	-.01	.018	.000	333.843	16.76	-3.11	.00	-11.30	29.73	8.28
100	SEABED	-256.42	-19.36	-.01	-.017	.000	337.343	16.76	-3.11	.00	-4.02	22.50	6.27
101	SEABED	-259.92	-19.36	.00	-.026	.000	340.843	16.76	-3.11	.00	-.15	18.67	5.20
102	SEABED	-263.42	-19.36	.00	-.023	.000	344.343	16.76	-3.11	.00	1.38	19.88	5.54
103	SEABED	-266.92	-19.36	.00	-.015	.000	347.843	16.76	-3.11	.00	1.60	20.10	5.60
104	SEABED	-270.42	-19.36	.00	-.008	.000	351.343	16.76	-3.11	.00	1.26	19.76	5.50
105	SEABED	-273.92	-19.36	.00	-.003	.000	354.843	16.76	-3.11	.00	.79	19.30	5.38
106	SEABED	-277.42	-19.36	.00	-.001	.000	358.343	16.76	-3.11	.00	.40	18.91	5.27
107	SEABED	-280.92	-19.36	.00	.001	.000	361.843	16.76	-3.11	.00	.15	18.66	5.20
108	SEABED	-284.42	-19.36	.00	.001	.000	365.343	16.76	-3.11	.00	.01	18.52	5.16

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	BENDING STRESSES HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
109	SEABED	-287.92	-19.36	.00	.001	.000	368.843	16.76	-3.11	.00	-.05	18.56	5.17
110	SEABED	-291.42	-19.36	.00	.001	.000	372.343	16.76	-3.11	.00	-.06	18.57	5.17
111	SEABED	-294.92	-19.36	.00	.000	.000	375.843	16.76	-3.11	.00	-.04	18.56	5.17
112	SEABED	-298.42	-19.36	.00	.000	.000	379.343	16.76	-3.11	.00	-.03	18.54	5.16
113	SEABED	-301.92	-19.36	.00	.000	.000	382.843	16.76	-3.11	.00	-.01	18.53	5.16
114	SEABED	-305.42	-19.36	.00	.000	.000	386.343	16.76	-3.11	.00	-.01	18.52	5.16
115	SEABED	-308.92	-19.36	.00	.000	.000	389.843	16.76	-3.11	.00	.00	18.51	5.16
116	SEABED	-312.42	-19.36	.00	.000	.000	393.343	16.76	-3.11	.00	.00	18.51	5.16
117	SEABED	-315.92	-19.36	.00	.000	.000	396.843	16.76	-3.11	.00	.00	18.51	5.16

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
1	LAYBARGE	78.48	6.21	.00	.19	.00	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.38	.00	.00	.00	-.01	.00	.00	.00
5	LAYBARGE	65.95	5.99	.00	.36	.00	.00	.00	-.01	.00	.00	.00
7	LAYBARGE	60.43	5.89	.00	.37	.00	.00	.00	-.02	.00	.00	.00
9	LAYBARGE	53.79	5.78	.00	.39	.00	.00	.00	-.03	.00	.00	.00
11	LAYBARGE	47.73	5.67	.00	.47	.00	.00	.00	-.03	.00	.00	.00
13	TENSIONR	38.54	5.55	.00	1.68	.00	.00	.00	294.16	.00	.00	.00
15	LAYBARGE	29.53	5.36	.00	.00	.00	.01	.00	294.15	.00	.00	.00
17	LAYBARGE	23.33	5.25	.00	1.57	.00	.00	.00	294.14	.00	.00	.00
19	LAYBARGE	17.33	5.11	.00	6.33	.00	.00	.00	294.11	.00	.00	.00
21	LAYBARGE	10.72	4.82	.00	9.54	.00	.00	.00	294.08	.00	.00	.00
24	STINGER	-.89	3.96	.00	10.42	.00	.00	.00	294.02	.00	.00	.00
26	STINGER	-8.31	3.16	.00	6.17	.00	.00	.00	294.00	.00	.00	.00
28	STINGER	-14.42	2.38	.00	9.24	.00	.00	.00	293.93	.00	.00	.00
30	STINGER	-24.80	.74	.00	7.69	-.18	.00	.00	293.84	.00	.00	.00
32	STINGER	-30.75	-.35	.00	1.15	-.74	.00	.00	293.80	.00	.00	.00
34	STINGER	-36.69	-1.45	.00	.00	-.94	.14	.00	293.74	.00	.00	.00
36	STINGER	-41.31	-2.31	.00	-.49	-36.09	.31	.00	293.14	.00	.00	.00
38	SAGBEND	-44.73	-2.94	.42	.00	.00	.00	.00	293.66	.00	.00	.00
39	SAGBEND	-48.15	-3.57	.83	.00	.00	.00	.00	293.62	.00	.00	.00
40	SAGBEND	-51.57	-4.19	1.24	.00	.00	.00	.00	293.59	.00	.00	.00
41	SAGBEND	-54.99	-4.81	1.64	.00	.00	.00	.00	293.56	.00	.00	.00
42	SAGBEND	-58.41	-5.43	2.04	.00	.00	.00	.00	293.52	.00	.00	.00
43	SAGBEND	-61.83	-6.05	2.43	.00	.00	.00	.00	293.49	.00	.00	.00
44	SAGBEND	-65.26	-6.67	2.81	.00	.00	.00	.00	293.46	.00	.00	.00
45	SAGBEND	-68.68	-7.28	3.19	.00	.00	.00	.00	293.43	.00	.00	.00
46	SAGBEND	-72.11	-7.90	3.56	.00	.00	.00	.00	293.39	.00	.00	.00
47	SAGBEND	-75.53	-8.51	3.93	.00	.00	.00	.00	293.36	.00	.00	.00
48	SAGBEND	-78.96	-9.12	4.29	.00	.00	.00	.00	293.33	.00	.00	.00
49	SAGBEND	-82.39	-9.72	4.65	.00	.00	.00	.00	293.30	.00	.00	.00
50	SAGBEND	-85.82	-10.33	5.00	.00	.00	.00	.00	293.26	.00	.01	.00
51	SAGBEND	-89.25	-10.93	5.35	.00	.00	.00	.00	293.23	.02	.03	.00
52	SAGBEND	-92.68	-11.53	5.70	.00	.00	.00	.00	293.20	.10	.18	.00
53	SAGBEND	-96.11	-12.12	6.03	.00	.00	.00	.00	293.15	.61	1.03	.00
54	SAGBEND	-99.55	-12.71	6.35	.00	.00	.00	.00	292.65	3.62	5.97	6.98
55	SAGBEND	-103.01	-13.20	6.52	.00	.00	.00	.00	292.31	30.93	50.25	59.01
56	SAGBEND	-106.47	-13.69	6.67	.00	.00	.00	.00	291.96	52.52	83.70	98.82
57	SAGBEND	-109.94	-14.16	6.80	.00	.00	.00	.00	291.61	69.59	108.67	129.04
58	SAGBEND	-111.68	-14.40	6.86	.00	.00	.00	.00	291.44	76.80	118.59	141.29
59	SAGBEND	-114.28	-14.74	6.94	.00	.00	.00	.00	291.19	86.07	130.68	156.48
60	SAGBEND	-116.87	-15.07	7.01	.00	.00	.00	.00	290.95	93.86	140.03	168.58
61	SAGBEND	-120.35	-15.50	7.07	.00	.00	.00	.00	290.65	102.31	149.08	180.81
62	SAGBEND	-123.82	-15.90	7.10	.00	.00	.00	.00	290.37	108.96	154.94	189.42
63	SAGBEND	-127.30	-16.29	7.11	.00	.00	.00	.00	290.11	114.14	158.30	195.16

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
64	SAGBEND	-130.78	-16.66	7.08	.00	.00	.00	.00	289.87	118.13	159.67	198.61
65	SAGBEND	-134.26	-17.00	7.02	.00	.00	.00	.00	289.65	121.11	159.42	200.21
66	SAGBEND	-137.75	-17.32	6.93	.00	.00	.00	.00	289.45	123.25	157.84	200.26
67	SAGBEND	-141.23	-17.61	6.81	.00	.00	.00	.00	289.27	124.64	155.08	198.96
68	SAGBEND	-144.72	-17.88	6.66	.00	.00	.00	.00	289.11	125.34	151.23	196.42
69	SAGBEND	-148.21	-18.13	6.49	.00	.00	.00	.00	288.96	125.39	146.30	192.68
70	SAGBEND	-151.69	-18.35	6.28	.00	.00	.00	.00	288.84	124.79	140.19	187.68
71	SAGBEND	-155.18	-18.55	6.04	.00	.00	.00	.00	288.74	123.48	132.75	181.30
72	SAGBEND	-158.67	-18.73	5.78	.00	.00	.00	.00	288.65	121.39	123.71	173.32
73	SAGBEND	-162.15	-18.88	5.50	.00	.00	.00	.00	288.58	118.41	112.70	163.47
74	SAGBEND	-165.64	-19.00	5.19	.00	.00	.00	.00	288.53	114.37	99.23	151.42
75	SAGBEND	-169.12	-19.11	4.87	.00	.00	.00	.00	288.50	109.04	82.63	136.81
76	SAGBEND	-172.60	-19.19	4.52	.00	.00	.00	.00	288.48	102.13	62.07	119.51
77	SAGBEND	-176.08	-19.26	4.17	.00	.00	.00	.00	288.47	93.25	36.44	100.11
78	SAGBEND	-179.56	-19.31	3.81	.00	.00	.00	.00	288.47	81.92	8.60	82.37
79	SAGBEND	-183.05	-19.34	3.45	.00	-.01	.00	.00	288.47	67.50	-18.75	70.06
80	SEABED	-186.53	-19.35	3.09	1.00	-1.01	.00	.00	288.46	49.24	-47.10	68.14
81	SEABED	-190.01	-19.36	2.74	2.94	-2.94	.00	.00	288.44	29.66	-74.47	80.15
82	SEABED	-193.49	-19.36	2.40	3.58	-3.58	.00	.00	288.42	14.29	-95.79	96.85
83	SEABED	-196.98	-19.36	2.09	3.47	-3.47	.00	.00	288.40	4.58	-109.98	110.07

84	SEABED	-200.47	-19.36	1.79	3.09	-3.09	.00	.00	288.38	-.39	-118.18	118.18
85	SEABED	-203.96	-19.36	1.52	2.71	-2.71	.00	.00	288.38	-2.22	-122.18	122.20
86	SEABED	-207.45	-19.36	1.27	2.42	-2.42	.00	.00	288.37	-2.36	-123.54	123.57
87	SEABED	-210.94	-19.36	1.04	2.25	-2.25	.00	.00	288.37	-1.79	-123.33	123.35
88	SEABED	-214.43	-19.36	.84	2.17	-2.17	.00	.00	288.38	-1.10	-122.14	122.15
89	SEABED	-217.93	-19.36	.66	2.14	-2.14	.00	.00	288.38	-.55	-120.21	120.21
90	SEABED	-221.43	-19.36	.51	2.14	-2.14	.00	.00	288.39	-.19	-117.51	117.51
91	SEABED	-224.92	-19.36	.38	2.16	-2.16	.00	.00	288.39	.00	-113.88	113.88
92	SEABED	-228.42	-19.36	.27	2.17	-2.17	.00	.00	288.40	.07	-109.10	109.10
93	SEABED	-231.92	-19.36	.18	2.18	-2.18	.00	.00	288.41	.08	-102.82	102.82
94	SEABED	-235.42	-19.36	.11	2.19	-2.19	.00	.00	288.42	.07	-94.68	94.68
95	SEABED	-238.92	-19.36	.06	2.19	-2.19	.00	.00	288.44	.04	-84.17	84.17
96	SEABED	-242.42	-19.36	.03	2.19	-2.19	.00	.00	288.45	.02	-70.72	70.72
97	SEABED	-245.92	-19.36	.01	2.19	-1.70	.00	.00	288.47	.01	-53.54	53.54
98	SEABED	-249.42	-19.36	.00	2.19	.45	.00	.00	288.48	.00	-33.56	33.56
99	SEABED	-252.92	-19.36	-.01	2.19	1.37	.00	.00	288.49	.00	-16.93	16.93
100	SEABED	-256.42	-19.36	-.01	2.19	1.36	.00	.00	288.49	.00	-6.03	6.03
101	SEABED	-259.92	-19.36	.00	2.19	.99	.00	.00	288.49	.00	-.23	.23
102	SEABED	-263.42	-19.36	.00	2.19	.59	.00	.00	288.49	.00	2.06	2.06
103	SEABED	-266.92	-19.36	.00	2.19	.28	.00	.00	288.49	.00	2.40	2.40
104	SEABED	-270.42	-19.36	.00	2.19	.08	.00	.00	288.49	.00	1.89	1.89
105	SEABED	-273.92	-19.36	.00	2.19	-.01	.00	.00	288.49	.00	1.19	1.19
106	SEABED	-277.42	-19.36	.00	2.19	-.05	.00	.00	288.49	.00	.60	.60
107	SEABED	-280.92	-19.36	.00	2.19	-.05	.00	.00	288.49	.00	.22	.22
108	SEABED	-284.42	-19.36	.00	2.19	-.04	.00	.00	288.49	.00	.01	.01

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
109	SEABED	-287.92	-19.36	.00	2.19	-.02	.00	.00	288.49	.00	-.07	.07
110	SEABED	-291.42	-19.36	.00	2.19	-.01	.00	.00	288.49	.00	-.08	.08
111	SEABED	-294.92	-19.36	.00	2.19	.00	.00	.00	288.49	.00	-.07	.07
112	SEABED	-298.42	-19.36	.00	2.19	.00	.00	.00	288.49	.00	-.04	.04
113	SEABED	-301.92	-19.36	.00	2.19	.00	.00	.00	288.49	.00	-.02	.02
114	SEABED	-305.42	-19.36	.00	2.19	.00	.00	.00	288.49	.00	-.01	.01
115	SEABED	-308.92	-19.36	.00	2.19	.00	.00	.00	288.49	.00	.00	.00
116	SEABED	-312.42	-19.36	.00	2.19	.00	.00	.00	288.49	.00	.00	.00
117	SEABED	-315.92	-19.36	.00	.00	.00	.00	.00	288.49	.00	.00	.00

```
*******************************************************************************************
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*                                                                                         *
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*                                                                                         *
*                        VERSION NO. - 2.05 AC                                            *
*                        RELEASED ON - 10/24/1993                                         *
*                        LICENSED TO - RICKY TAWEKAL                                      *
*                                                                                         *
*******************************************************************************************
*                                                                                         *
*    OFFPIPE IS A NONLINEAR,  3-DIMENSIONAL FINITE ELEMENT METHOD BASED PROGRAM FOR THE   *
*    STATIC AND DYNAMIC ANALYSIS OF PROBLEMS ARISING IN THE DESIGN OF MARINE PIPELINES.   *
*    THIS VERSION  OF OFFPIPE MAY BE USED FOR THE ANALYSIS OF OFFSHORE PIPELAYING OPER-   *
*    ATIONS AND DAVIT LIFTS.                                                              *
*                                                                                         *
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*                                                                                         *
*                ROBERT C. MALAHY, JR.          TELEPHONE: (713) 664-8635                *
*                8007 MULLINS                   FACSIMILE: (713) 664-0962                *
*                HOUSTON, TEXAS 77081                                                    *
*                U.S.A.                                                                   *
*                                                                                         *
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OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC         PAGE   3
Abandonment and Recovery
JOB NO. -                    LICENSED TO: RICKY TAWEKAL
USER ID - M. S. Pasengo      DATE -  7/27/2015   TIME -  5:17:15   CASE   1
=========================================================================

                    I N P U T   D A T A   E C H O


PROFILE PLOT TABLE ENTRIES
==========================
   PLOT TABLE INDEX ..................         2
   PLOT NUMBER .......................         2
   PLOT TYPE OPTION NUMBER ...........         1
   DYNAMIC PROFILE TIME POINT ........      .000
   DYNAMIC PROFILE TIME INCREMENT ....      .000
   ORDINATE PARAMETER CODE NUMBER ....        14
   AXIS LABEL FOR ORDINATE ........... "                              "
   ABSCISSA PARAMETER CODE NUMBER ....         1
   AXIS LABEL FOR ABSCISSA ........... "                              "

   PLOT TITLE ........................ "                                                  "
   MINIMUM HORIZONTAL AXIS RANGE .....      .000
   MAXIMUM HORIZONTAL AXIS RANGE .....      .000
   MINIMUM VERTICAL AXIS RANGE .......      .000
   MAXIMUM VERTICAL AXIS RANGE .......      .000

PROFILE PLOT TABLE ENTRIES
==========================
   PLOT TABLE INDEX ..................         1
   PLOT NUMBER .......................         1
   PLOT TYPE OPTION NUMBER ...........         1
   DYNAMIC PROFILE TIME POINT ........      .000
   DYNAMIC PROFILE TIME INCREMENT ....      .000
   ORDINATE PARAMETER CODE NUMBER ....         2
   AXIS LABEL FOR ORDINATE ........... "                              "
   ABSCISSA PARAMETER CODE NUMBER ....         1
   AXIS LABEL FOR ABSCISSA ........... "                              "

   PLOT TITLE ........................ "                                                  "
   MINIMUM HORIZONTAL AXIS RANGE .....      .000
   MAXIMUM HORIZONTAL AXIS RANGE .....      .000
   MINIMUM VERTICAL AXIS RANGE .......      .000
   MAXIMUM VERTICAL AXIS RANGE .......      .000


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OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC         PAGE   4
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                    I N P U T   D A T A   E C H O


PROFILE PLOT TABLE ENTRIES
==========================
```

```
   PLOT TABLE INDEX .................          3
   PLOT NUMBER ......................          1
   PLOT TYPE OPTION NUMBER ..........          1
   DYNAMIC PROFILE TIME POINT .......       .000
   DYNAMIC PROFILE TIME INCREMENT ...       .000
   ORDINATE PARAMETER CODE NUMBER ...          3
   AXIS LABEL FOR ORDINATE .......... "                                "
   ABSCISSA PARAMETER CODE NUMBER ...          1
   AXIS LABEL FOR ABSCISSA .......... "                                "

   PLOT TITLE ....................... "                                                "
   MINIMUM HORIZONTAL AXIS RANGE ....       .000
   MAXIMUM HORIZONTAL AXIS RANGE ....       .000
   MINIMUM VERTICAL AXIS RANGE ......       .000
   MAXIMUM VERTICAL AXIS RANGE ......       .000

PLOTTER CONFIGURATION
=====================
   PLOTTER TYPE OPTION NUMBER .......          3
   DATA RANGE OPTION NUMBER .........          2
   PLOT PAGE WIDTH ( IN ) ...........       .000
   PLOT PAGE HEIGHT ( IN ) ..........       .000

PRINTED OUTPUT SELECTED
=======================
   PRINT PIPE STRAINS IN OUTPUT .....NO
   USE DNV STRESS FORMULA ...........NO
   STATIC PIPE FORCES AND STRESSES ...YES
   STATIC SOLUTION SUMMARY ..........NO
   OVERBEND PIPE SUPPORT GEOMETRY ....NO
   STINGER BALLAST SCHEDULE DATA .....NO
   DYNAMIC PIPE FORCES AND STRESSES ..YES
   DYNAMIC RANGE OF PIPE DATA ........NO
   DYNAMIC TRACKING OF PIPE DATA .....NO
   PLOT DATA FILE SUMMARY TABLES .....NO


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OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE   5
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================================================================================

                    I N P U T   D A T A   E C H O


PIPE PROPERTIES
===============
   PIPE PROPERTY TABLE ROW ...........          2
   PIPE SECTION LENGTH ..............    12.100 M
   STEEL MODULUS OF ELASTICITY ......   207000. MPA
   AREA OF STEEL CROSS SECTION ......      .000 CM**2
   COATED PIPE AVG MOMENT OF INERTIA .       .00 CM**4
   WEIGHT PER-UNIT-LENGTH IN AIR .....       .00 N/M
   WEIGHT PER-UNIT-LENGTH SUBMERGED ..       .00 N/M
   MAXIMUM ALLOWABLE PIPE STRAIN .....  .000000 PCT

   STEEL OUTSIDE DIAMETER ............   40.6400 CM
   STEEL WALL THICKNESS ..............    1.2700 CM
   YIELD STRESS ......................    359.00 MPA
   STRESS/STRAIN INTENSE FACTOR ......     .0000
   HYDRODYNAMIC OUTSIDE DIAMETER .....      .000 CM
   DRAG COEFFICIENT ..................     .0000
   HYDRODYNAMIC TOTAL AREA ...........      .000 CM**2
   ADDED MASS COEFFICIENT ............     .0000
   POISSON'S RATIO ...................     .3000
   COEFFICIENT OF THERMAL EXPANSION .. .00000000 1/DEG C

CABLE PROPERTIES
================
   PIPE PROPERTY TABLE INDEX .........          1
   CABLE SECTION LENGTH ..............      .000 M
   AXIAL STIFFNESS (EA) ..............       .00 KN
   BENDING STIFFNESS (EI) ............     .0000 KN-M**2
   WEIGHT PER-UNIT-LENGTH IN AIR .....       .0 N/M
   WEIGHT PER-UNIT-LENGTH SUBMERGED ..       .0 N/M

   CABLE DIAMETER ....................     3.800 CM
   DRAG COEFFICIENT ..................      .000
   CABLE CROSS SECTIONAL AREA ........      .000 KN
   ADDED MASS COEFFICIENT ............      .000


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OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE   6
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================================================================================

                    I N P U T   D A T A   E C H O


PIPE COATING PROPERTIES
=======================
   PIPE PROPERTY TABLE INDEX .........          2
   CORROSION COATING THICKNESS .......       .550 CM
   CONCRETE COATING THICKNESS ........      2.540 CM
   STEEL WEIGHT DENSITY ..............    77009. N/M**3
   CORROSION COATING WEIGHT DENSITY ..    12750. N/M**3
   CONCRETE COATING WEIGHT DENSITY ...    29860. N/M**3
   DESIRED PIPE SPECIFIC GRAVITY .....       .0000

   AVERAGE PIPE JOINT LENGTH .........    12.100 M
   FIELD JOINT LENGTH ................      .000 M
   JOINT FILL WEIGHT DENSITY .........    10052. N/M**3
   DENSITY OF PIPE CONTENTS ..........        0. N/M**3

PIPE TENSION
============
   STATIC PIPE TENSION ON LAYBARGE ...   294.200 KN
   MINIMUM DYNAMIC PIPE TENSION ......      .000 KN
   MAXIMUM DYNAMIC PIPE TENSION ......      .000 KN

LAYBARGE DESCRIPTION
====================
   NUMBER OF PIPE NODES ..............         11
```

```
   BARGE GEOMETRY SPECIFIED BY .......         1 X-Y COORDINATES
   OVERBEND PIPE SUPPORT RADIUS ......   300.000 M
   TANGENT POINT X-COORDINATE ........      .000 M
   TANGENT POINT Y-COORDINATE ........      .000 M
   PIPE ANGLE RELATIVE TO DECK .......    .0000 DEG
   HEIGHT OF DECK ABOVE WATER ........     3.600 M
   LAYBARGE FORWARD (X) OFFSET .......      .000 M
   BARGE TRIM ANGLE ..................    .0000 DEG

   STERN SHOE X COORDINATE ..........      .000 M
   STERN SHOE Y COORDINATE ...........     .000 M
   ROTATION CENTER X COORDINATE ......   13.750 M
   ROTATION CENTER Y COORDINATE ......   -3.600 M
   ROTATION CENTER Z COORDINATE ......     .000 M
   BARGE HEADING .....................    .0000 DEG
   BARGE OFFSET FROM RIGHT-OF-WAY ....     .000 M
   PIPE RAMP PIVOT X COORDINATE ......     .000 M
   PIPE RAMP PIVOT Y COORDINATE ......     .000 M
   PIPE RAMP PIVOT ROTATION ANGLE ....     .000 DEG


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OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE   7
Abandonment and Recovery
JOB NO. -                          LICENSED TO: RICKY TAWEKAL
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                        I N P U T   D A T A   E C H O


    NODE X      NODE Y          SUPPORT           DAVIT
     COORD       COORD            TYPE           SPACING
     (M   )      (M   )                           (M   )
   ========   ========   ====================   =======
     78.480      2.608     1  SIMPLE SUPPORT        .000
     72.120      2.498     1  SIMPLE SUPPORT        .000
     65.950      2.390     1  SIMPLE SUPPORT        .000
     60.430      2.293     1  SIMPLE SUPPORT        .000
     53.790      2.177     1  SIMPLE SUPPORT        .000
     47.730      2.071     1  SIMPLE SUPPORT        .000
     38.540      1.951     2  PIPE TENSIONER        .000
     29.530      1.754     1  SIMPLE SUPPORT        .000
     23.330      1.646     1  SIMPLE SUPPORT        .000
     17.330      1.507     1  SIMPLE SUPPORT        .000
     10.720      1.220     1  SIMPLE SUPPORT        .000

STINGER DESCRIPTION
===================
   NUMBER OF PIPE/STINGER NODES ......         7
   STINGER GEOMETRY SPECIFIED BY .....         1 X-Y COORD AND TANGENT PT
   STINGER TYPE ......................         1 FIXED GEOMETRY OR RAMP
   OVERBEND PIPE SUPPORT RADIUS ......       .00 M
   HITCH X-COORDINATE ................      .000 M
   HITCH Y-COORDINATE ................     3.600 M

   X COORDINATE OF LOCAL ORIGIN ......      .000 M
   Y COORDINATE OF LOCAL ORIGIN ......      .000 M
   ROTATION ABOUT STINGER HITCH ......      .000 DEG
   TANGENT POINT X-COORDINATE ........      .000 M
   TANGENT POINT Y-COORDINATE ........      .000 M
   TANGENT POINT ANGLE ...............      .000 DEG

    NODE X      NODE Y          SUPPORT                ELEMENT          ELEMENT
     COORD       COORD            TYPE                   TYPE           LENGTH
     (M   )      (M   )                                                  (M   )
   ========   ========   ====================   ====================   =======
      -.890       .360     1  SIMPLE SUPPORT       2  HINGED END           .000
     -8.310      -.440     1  SIMPLE SUPPORT       1  FIXED END            .000
    -14.420     -1.220     1  SIMPLE SUPPORT       1  FIXED END            .000
    -24.800     -2.860     1  SIMPLE SUPPORT       1  FIXED END            .000
    -30.750     -3.950     1  SIMPLE SUPPORT       1  FIXED END            .000
    -36.660     -5.190     1  SIMPLE SUPPORT       1  FIXED END            .000
    -41.250     -6.210     1  SIMPLE SUPPORT       2  HINGED END           .000


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OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE   8
Abandonment and Recovery
JOB NO. -                          LICENSED TO: RICKY TAWEKAL
USER ID - M. S. Pasengo            DATE -  7/27/2015   TIME -  5:17:15   CASE   1
================================================================================

                        I N P U T   D A T A   E C H O


CURRENT VELOCITIES
==================
    WATER      CURRENT      DIRECTION
    DEPTH       SPEED       OF TRAVEL
   (M   )      (M/S )        (DEG )
   ======     =======      =========
     .000       3.500        90.000
    9.675       2.700        90.000
   19.350       1.900        90.000

SAGBEND GEOMETRY
================
   SAGBEND PIPE ELEMENT LENGTH .......    15.000 M
   WATER DEPTH .......................    13.05 M
   ESTIMATED SAGBEND X LENGTH ........      .00 M
   ESTIMATED PIPE LENGTH ON SEABED ...   100.00 M
   X-COORD OF PIPE FREE END ON SEABED       .00 M
   ESTIMATED SPAN DEPTH FOR BOW LINE .      .00 M
   PIPE VERTICAL ANGLE AT SEABED .....     .000 DEG
   X-COORDINATE OF SPECIFIED DEPTH ...      .00 M
   MAXIMUM SLOPE (ANGLE) OF SEABED ...     .000 DEG
   DIRECTION OF MAXIMUM SLOPE ........     .000 DEG

SAGBEND PIPE ELEMENT LENGTHS
============================
  NUMBER OF     ELEMENT
   ELEMENTS      LENGTH
                 (M   )
  ---------     -------
     100         15.000

WAVE SPECTRUM COEFFICIENTS
```

```
==========================
   NUMBER OF WAVES IN SPECTRUM .......        20
   1ST SPECTRUM COEFFICIENT ..........    1.0506 M2/S4
   2ND SPECTRUM COEFFICIENT ..........     .3249 1/S**4
   MINIMUM FREQUENCY IN SPECTRUM .....     .1000 RAD/S
   MAXIMUM FREQUENCY IN SPECTRUM .....    2.5000 RAD/S
   DIRECTION OF WAVE TRAVEL ..........    90.000 DEG

TIME INTEGRATION PARAMETERS
=======================
   TIME STEP LENGTH ..................     .4000 SEC
   SOLUTION STARTS AT TIME ...........    60.000 SEC
   MAXIMUM TIME OF INTEGRATION ....... 10860.000 SEC
   SOLUTION SAMPLING TIME STEP........     .800 SEC
   DAMPING RATIO .....................    .0000


================================================================================
OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE   9
Abandonment and Recovery
JOB NO. -                          LICENSED TO: RICKY TAWEKAL
USER ID - M. S. Pasengo            DATE -  7/27/2015   TIME -  5:17:15   CASE   1
================================================================================

                        I N P U T   D A T A   E C H O


BARGE MOTION RAO TABLE ( OFFPIPE  ) SIGN CONVENTION
===================================================
     WAVE    /------ SURGE -----/  /------ SWAY ------/  /------ HEAVE -----/
  FREQUENCY   AMPLITUDE    PHASE    AMPLITUDE    PHASE    AMPLITUDE    PHASE
  (RAD/S  )    (M/M  )     (DEG)     (M/M  )     (DEG)     (M/M  )     (DEG)
  =========    =======   =======    =======    =======    =======    =======
     .1000      .0000        .00      .0000        .00     1.0000        .00
     .2260      .0000        .00      .0000        .00     1.0000        .00
     .3530      .0000        .00      .0000        .00      .9990       -.10
     .4790      .0000        .00      .0000        .00      .9940       -.50
     .6050      .0000        .00      .0000        .00      .9780      -1.50
     .7320      .0000        .00      .0000        .00      .9360      -3.20
     .8580      .0000        .00      .0000        .00      .8570      -5.90
     .9840      .0000        .00      .0000        .00      .7200      -9.10
    1.1110      .0000        .00      .0000        .00      .5360      -9.30
    1.2370      .0000        .00      .0000        .00      .3660      -3.10
    1.3630      .0000        .00      .0000        .00      .2390      11.30
    1.4890      .0000        .00      .0000        .00      .1620      33.70
    1.6160      .0000        .00      .0000        .00      .1200      58.90
    1.7420      .0000        .00      .0000        .00      .0870      81.40
    1.8680      .0000        .00      .0000        .00      .0570     108.70
    1.9950      .0000        .00      .0000        .00      .0350     145.00
    2.1210      .0000        .00      .0000        .00      .0290    -162.40
    2.2470      .0000        .00      .0000        .00      .0410    -136.50
    2.3740      .0000        .00      .0000        .00      .0600      14.90
    2.5000      .0000        .00      .0000        .00      .0190      35.10

     WAVE    /------ ROLL ------/  /------ PITCH -----/  /------- YAW ------/
  FREQUENCY   AMPLITUDE    PHASE    AMPLITUDE    PHASE    AMPLITUDE    PHASE
  (RAD/S  )   (DEG/M )     (DEG)    (DEG/M )     (DEG)    (DEG/M )     (DEG)
  =========   ========    =======   ========    =======   ========    =======
     .1000     1.0260      90.00      .0000     -16.00      .0000        .00
     .2260     1.0360      90.00      .0000     -44.20      .0000        .00
     .3530     1.0530      90.00      .0000     -60.20      .0000        .00
     .4790     1.0840      90.20      .0000     -56.50      .0000        .00
     .6050     1.1380      91.10      .0010     -45.40      .0000        .00
     .7320     1.2290      93.70      .0010     -59.10      .0000        .00
     .8580     1.3800     101.30      .0020     -97.90      .0000        .00
     .9840     1.4970     122.50      .0030    -148.20      .0000        .00
    1.1110     1.0410     153.70      .0020     156.80      .0000        .00
    1.2370      .5230     164.20      .0010      97.60      .0000        .00
    1.3630      .2660     159.60      .0010      44.70      .0000        .00
    1.4890      .1380     146.20      .0010      48.30      .0000        .00
    1.6160      .0710     125.40      .0010      33.00      .0000        .00
    1.7420      .0390      90.40      .0010      10.80      .0000        .00
    1.8680      .0270      54.60      .0010     -12.40      .0000        .00
    1.9950      .0210      28.50      .0010     -26.80      .0000        .00
    2.1210      .0130      11.20      .0000     -52.60      .0000        .00
    2.2470      .0050      -8.60      .0000    -177.60      .0000        .00


================================================================================
OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE  10
Abandonment and Recovery
JOB NO. -                          LICENSED TO: RICKY TAWEKAL
USER ID - M. S. Pasengo            DATE -  7/27/2015   TIME -  5:17:15   CASE   1
================================================================================

                        I N P U T   D A T A   E C H O

    2.3740      .0080    -116.60      .0060      13.30      .0000        .00
    2.5000      .0020      86.50      .0010     -18.00      .0000        .00


================================================================================
OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE  11
Abandonment and Recovery
JOB NO. -                          LICENSED TO: RICKY TAWEKAL
USER ID - M. S. Pasengo            DATE -  7/27/2015   TIME -  5:17:15   CASE   2
================================================================================

                        I N P U T   D A T A   E C H O


CABLE PROPERTIES
================
   PIPE PROPERTY TABLE INDEX .........        1
   CABLE SECTION LENGTH ..............   120.000 M
   AXIAL STIFFNESS (EA) ..............      .00 KN
   BENDING STIFFNESS (EI) ............    .0000 KN-M**2
   WEIGHT PER-UNIT-LENGTH IN AIR .....      .0 N/M
   WEIGHT PER-UNIT-LENGTH SUBMERGED ..      .0 N/M

   CABLE DIAMETER ....................    3.800 CM
   DRAG COEFFICIENT ..................     .000
   CABLE CROSS SECTIONAL AREA ........     .000 KN
   ADDED MASS COEFFICIENT ............     .000

SAGBEND GEOMETRY
================
   SAGBEND PIPE ELEMENT LENGTH .......   15.000 M
```

```
   WATER DEPTH .....                13.05 M
   ESTIMATED SAGBEND X LENGTH .....    100.00 M
   ESTIMATED PIPE LENGTH ON SEABED ...    100.00 M
   X-COORD OF PIPE FREE END ON SEABED       .00 M
   ESTIMATED SPAN DEPTH FOR BOW LINE .      .00 M
   PIPE VERTICAL ANGLE AT SEABED .....      .000 DEG
   X-COORDINATE OF SPECIFIED DEPTH ...      .00 M
   MAXIMUM SLOPE (ANGLE) OF SEABED ...      .000 DEG
   DIRECTION OF MAXIMUM SLOPE .....         .000 DEG

SAGBEND PIPE ELEMENT LENGTHS
============================
  NUMBER OF     ELEMENT
   ELEMENTS      LENGTH
                 (M   )
  ---------     -------
     100          5.000
     100          5.000
     100         50.000


================================================================================
OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE  12
Abandonment and Recovery
JOB NO. -                        LICENSED TO: RICKY TAWEKAL
USER ID - M. S. Pasengo          DATE -  7/27/2015   TIME -  5:17:15   CASE   3
================================================================================

                        I N P U T   D A T A   E C H O


CABLE PROPERTIES
================
   PIPE PROPERTY TABLE INDEX .....          1
   CABLE SECTION LENGTH .....      150.000 M
   AXIAL STIFFNESS (EA) .....          .00 KN
   BENDING STIFFNESS (EI) .....      .0000 KN-M**2
   WEIGHT PER-UNIT-LENGTH IN AIR .....       .0 N/M
   WEIGHT PER-UNIT-LENGTH SUBMERGED ..       .0 N/M

   CABLE DIAMETER .....             3.800 CM
   DRAG COEFFICIENT .....              .000
   CABLE CROSS SECTIONAL AREA .....    .000 KN
   ADDED MASS COEFFICIENT .....        .000

SAGBEND GEOMETRY
================
   SAGBEND PIPE ELEMENT LENGTH .....    15.000 M
   WATER DEPTH .....                13.05 M
   ESTIMATED SAGBEND X LENGTH .....    100.00 M
   ESTIMATED PIPE LENGTH ON SEABED ...    100.00 M
   X-COORD OF PIPE FREE END ON SEABED       .00 M
   ESTIMATED SPAN DEPTH FOR BOW LINE .      .00 M
   PIPE VERTICAL ANGLE AT SEABED .....      .000 DEG
   X-COORDINATE OF SPECIFIED DEPTH ...      .00 M
   MAXIMUM SLOPE (ANGLE) OF SEABED ...      .000 DEG
   DIRECTION OF MAXIMUM SLOPE .....         .000 DEG

SAGBEND PIPE ELEMENT LENGTHS
============================
  NUMBER OF     ELEMENT
   ELEMENTS      LENGTH
                 (M   )
  ---------     -------
     100          3.300
     100          5.000
     100         50.000


================================================================================
OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE  13
Abandonment and Recovery
JOB NO. -                        LICENSED TO: RICKY TAWEKAL
USER ID - M. S. Pasengo          DATE -  7/27/2015   TIME -  5:17:15   CASE   4
================================================================================

                        I N P U T   D A T A   E C H O


CABLE PROPERTIES
================
   PIPE PROPERTY TABLE INDEX .....          1
   CABLE SECTION LENGTH .....      180.000 M
   AXIAL STIFFNESS (EA) .....          .00 KN
   BENDING STIFFNESS (EI) .....      .0000 KN-M**2
   WEIGHT PER-UNIT-LENGTH IN AIR .....       .0 N/M
   WEIGHT PER-UNIT-LENGTH SUBMERGED ..       .0 N/M

   CABLE DIAMETER .....             3.800 CM
   DRAG COEFFICIENT .....              .000
   CABLE CROSS SECTIONAL AREA .....    .000 KN
   ADDED MASS COEFFICIENT .....        .000

SAGBEND GEOMETRY
================
   SAGBEND PIPE ELEMENT LENGTH .....    15.000 M
   WATER DEPTH .....                13.05 M
   ESTIMATED SAGBEND X LENGTH .....    100.00 M
   ESTIMATED PIPE LENGTH ON SEABED ...    100.00 M
   X-COORD OF PIPE FREE END ON SEABED       .00 M
   ESTIMATED SPAN DEPTH FOR BOW LINE .      .00 M
   PIPE VERTICAL ANGLE AT SEABED .....      .000 DEG
   X-COORDINATE OF SPECIFIED DEPTH ...      .00 M
   MAXIMUM SLOPE (ANGLE) OF SEABED ...      .000 DEG
   DIRECTION OF MAXIMUM SLOPE .....         .000 DEG

SAGBEND PIPE ELEMENT LENGTHS
============================
  NUMBER OF     ELEMENT
   ELEMENTS      LENGTH
                 (M   )
  ---------     -------
     100          3.300
     100          5.000
     100         50.000

END OF INPUT DATA
```

STATIC SOLUTION CONVERGED IN (21) ITERATIONS

STATIC SOLUTION CONVERGED IN (46) ITERATIONS

STATIC SOLUTION CONVERGED IN (89) ITERATIONS

STATIC SOLUTION CONVERGED IN (77) ITERATIONS

STATIC PIPE COORDINATES, FORCES AND STRESSES

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	BENDING STRESSES HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
1	LAYBARGE	78.48	6.21	.00	.000	1.001	.000	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.000	.994	6.361	-.02	.00	-8.80	.00	8.81	2.46
5	LAYBARGE	65.95	5.99	.00	.000	1.005	12.532	-.03	.00	-3.88	.00	3.91	1.09
7	LAYBARGE	60.43	5.89	.00	.000	1.011	18.053	-.05	.00	-5.70	.00	5.75	1.60
9	LAYBARGE	53.79	5.78	.00	.000	.981	24.694	-.06	.00	.76	.00	.83	.23
11	LAYBARGE	47.73	5.68	.00	.000	.846	30.755	-.08	.00	22.44	.00	22.52	6.27
13	TENSIONR	38.54	5.55	.00	.000	.910	39.945	18.63	.00	-54.81	-.01	73.44	20.46
15	LAYBARGE	29.53	5.38	.00	.000	1.105	48.958	18.61	.00	.83	.00	19.44	5.41
17	LAYBARGE	23.33	5.26	.00	.000	1.211	55.159	18.59	.00	-36.40	.00	54.99	15.32
19	LAYBARGE	17.33	5.11	.00	.000	1.871	61.160	18.54	.00	-136.90	-.01	155.44	43.30
21	LAYBARGE	10.72	4.82	.00	.000	3.135	67.777	18.49	.00	-159.80	.02	178.30	49.66
24	STINGER	-.89	3.96	.00	-.001	5.370	79.420	18.36	.00	-172.01	-.11	190.37	53.03
26	STINGER	-8.31	3.17	.00	.002	6.769	86.883	18.26	.00	-123.50	.57	141.76	39.49
28	STINGER	-14.42	2.38	.00	-.006	7.958	93.043	18.12	.00	-173.97	-2.44	192.11	53.51
30	STINGER	-24.80	.74	.00	.031	9.917	103.552	17.89	.00	-139.66	7.70	157.76	43.94
32	STINGER	-30.75	-.35	.00	-.106	10.753	109.601	17.75	-.06	-73.01	-43.72	102.88	28.66
34	STINGER	-36.68	-1.50	.00	.401	11.108	115.640	17.59	-.24	-17.23	157.05	175.70	48.94
36	STINGER	-41.29	-2.41	.00	-1.377	11.113	120.342	16.93	-.39	27.41	-710.86	728.51	202.93
38	SAGBEND	-55.94	-5.19	1.57	-8.752	10.111	135.343	17.15	-.83	67.63	-103.18	140.93	39.26
39	SAGBEND	-70.56	-7.63	3.86	-8.353	8.568	150.344	16.84	-1.23	81.91	103.23	149.24	41.57
40	SAGBEND	-85.31	-9.64	5.67	-5.436	6.822	165.345	16.58	-1.55	89.00	165.49	205.26	57.17
41	SAGBEND	-100.20	-11.19	6.62	-1.877	4.981	180.345	16.38	-1.80	91.26	175.25	214.87	59.85
42	SAGBEND	-115.16	-12.25	6.65	1.609	3.144	195.346	16.26	-1.97	88.01	161.51	201.18	56.04
43	SAGBEND	-130.12	-12.84	5.83	4.579	1.458	210.346	16.20	-2.07	74.74	123.23	161.37	44.95
44	SEABED	-145.05	-13.05	4.37	6.282	.247	225.346	16.19	-2.10	37.62	28.81	64.66	18.01
45	SEABED	-159.96	-13.06	2.76	5.731	-.026	240.346	16.19	-2.10	-.33	-62.63	79.89	22.25
46	SEABED	-174.91	-13.06	1.45	4.206	-.002	255.346	16.19	-2.10	-.57	-80.84	98.10	27.33
47	SEABED	-189.88	-13.06	.57	2.528	.001	270.346	16.19	-2.10	.06	-80.88	98.14	27.34
48	SEABED	-204.87	-13.06	.11	.995	.000	285.346	16.19	-2.10	.00	-65.14	82.40	22.95
49	SEABED	-219.87	-13.06	.00	.069	.000	300.346	16.19	-2.10	.00	-19.33	36.62	10.20
50	SEABED	-234.87	-13.06	.00	-.018	.000	315.346	16.20	-2.10	.00	1.62	18.95	5.28
51	SEABED	-249.87	-13.06	.00	.001	.000	330.346	16.20	-2.10	.00	.14	17.48	4.87
52	SEABED	-264.87	-13.06	.00	.000	.000	345.346	16.20	-2.10	.00	.00	17.34	4.83

STATIC PIPE COORDINATES, FORCES AND STRESSES

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
1	LAYBARGE	78.48	6.21	.00	5.42	.00	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	18.02	.00	.00	.00	-.26	-13.19	.00	13.19
5	LAYBARGE	65.95	5.99	.00	12.08	.00	.00	.00	-.51	-5.82	.00	5.82
7	LAYBARGE	60.43	5.89	.00	16.27	.00	.00	.00	-.74	-8.55	.00	8.55
9	LAYBARGE	53.79	5.78	.00	18.86	.00	.00	.00	-1.02	1.14	.00	1.14
11	LAYBARGE	47.73	5.68	.00	.00	.00	.01	.00	-1.26	33.64	.00	33.64
13	TENSIONR	38.54	5.55	.00	44.07	.00	.00	.00	292.62	-82.18	-.01	82.18
15	LAYBARGE	29.53	5.38	.00	.00	.00	.03	.00	292.28	1.24	.00	1.24
17	LAYBARGE	23.33	5.26	.00	.00	.01	.02	.00	291.97	-54.58	.00	54.58
19	LAYBARGE	17.33	5.11	.00	39.92	.00	.00	.00	291.30	-205.25	-.01	205.25
21	LAYBARGE	10.72	4.82	.00	33.95	.02	.00	.00	290.50	-239.59	.04	239.59
24	STINGER	-.89	3.96	.00	43.17	-.15	.00	.00	288.40	-257.90	-.16	257.90
26	STINGER	-8.31	3.17	.00	.00	.87	.01	.00	286.79	-185.16	.85	185.17
28	STINGER	-14.42	2.38	.00	44.79	-2.18	.00	.00	284.67	-260.83	-3.65	260.85
30	STINGER	-24.80	.74	.00	36.09	11.92	.00	.00	281.00	-209.39	11.54	209.71
32	STINGER	-30.75	-.35	.00	7.37	-71.61	.00	.00	279.26	-109.46	-65.55	127.59
34	STINGER	-36.68	-1.50	.00	-.47	314.81	.09	.00	278.22	-25.83	235.47	236.88
36	STINGER	-41.29	-2.41	.00	-2.06	-385.37	.21	.00	269.09	41.09	-1065.79	1066.59
38	SAGBEND	-55.94	-5.19	1.57	.00	.00	.00	.00	276.08	101.39	-154.70	184.97
39	SAGBEND	-70.56	-7.63	3.86	.00	.00	.00	.00	274.51	122.80	154.77	197.57
40	SAGBEND	-85.31	-9.64	5.67	.00	.00	.00	.00	272.94	133.44	248.11	281.72
41	SAGBEND	-100.20	-11.19	6.62	.00	.00	.00	.00	271.91	136.82	262.75	296.24
42	SAGBEND	-115.16	-12.25	6.65	.00	.00	.00	.00	271.34	131.95	242.15	275.77
43	SAGBEND	-130.12	-12.84	5.83	.00	.00	.00	.00	271.20	112.05	184.76	216.09
44	SEABED	-145.05	-13.05	4.37	5.65	-5.84	.00	.00	271.40	56.41	43.20	71.05
45	SEABED	-159.96	-13.06	2.76	13.06	-13.05	.00	.00	271.37	-.50	-93.89	93.90
46	SEABED	-174.91	-13.06	1.45	9.46	-9.46	.00	.00	271.31	-.86	-121.20	121.21
47	SEABED	-189.88	-13.06	.57	9.31	-9.31	.00	.00	271.31	.09	-121.27	121.27
48	SEABED	-204.87	-13.06	.11	9.38	-9.28	.00	.00	271.35	.01	-97.66	97.66
49	SEABED	-219.87	-13.06	.00	9.38	.60	.00	.00	271.41	.00	-28.98	28.98
50	SEABED	-234.87	-13.06	.00	9.38	2.19	.00	.00	271.42	.00	2.42	2.42
51	SEABED	-249.87	-13.06	.00	9.38	-.13	.00	.00	271.42	.00	.21	.21
52	SEABED	-264.87	-13.06	.00	.00	-.03	.00	.00	271.42	.00	.00	.00

STATIC PIPE COORDINATES, FORCES AND STRESSES

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
1	LAYBARGE	78.48	6.21	.00	.000	.991	.000	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.000	.997	6.361	.00	.00	.00	.00	.00	.00
5	LAYBARGE	65.95	5.99	.00	.000	1.005	12.532	.00	.00	.00	.00	.00	.00
7	LAYBARGE	60.43	5.89	.00	.000	1.004	18.053	.00	.00	.00	.00	.00	.00
9	LAYBARGE	53.79	5.78	.00	.000	1.001	24.694	.00	.00	.00	.00	.00	.00
11	LAYBARGE	47.73	5.67	.00	.000	.875	30.755	.00	.00	.00	.00	.00	.00
13	TENSIONR	38.54	5.55	.00	.000	.967	39.945	.00	.00	.00	.00	.00	.00
15	LAYBARGE	29.53	5.36	.00	.000	1.140	48.958	.00	.00	.00	.00	.00	.00
17	LAYBARGE	23.33	5.25	.00	.000	1.212	55.159	.00	.00	.00	.00	.00	.00
19	LAYBARGE	17.33	5.11	.00	.000	1.907	61.160	.00	.00	.00	.00	.00	.00
21	LAYBARGE	10.72	4.82	.00	.000	3.361	67.777	.00	.00	.00	.00	.00	.00
24	STINGER	-.89	3.96	.00	.000	5.195	79.419	.00	.00	.00	.00	.00	.00
26	STINGER	-8.31	3.16	.00	.000	6.714	86.882	.00	.00	.00	.00	.00	.00
28	STINGER	-14.42	2.38	.00	.000	8.127	93.042	.00	.00	.00	.00	.00	.00
30	STINGER	-24.80	.74	.00	.000	9.680	103.551	.00	.00	.00	.00	.00	.00
32	STINGER	-30.75	-.35	.00	.000	11.115	109.600	.00	.00	.00	.00	.00	.00
34	STINGER	-36.66	-1.59	.00	-.002	12.189	115.639	.00	.00	.00	.00	.00	.00
36	STINGER	-41.25	-2.61	.00	-13.595	10.394	120.358	17.96	-.42	.00	.00	18.17	5.06
38	SAGBEND	-46.03	-3.51	1.15	-13.328	10.310	125.358	17.84	-.56	23.23	72.62	94.38	26.29
39	SAGBEND	-49.27	-4.11	1.90	-12.902	10.175	128.738	17.76	-.66	35.37	107.97	131.71	36.69
40	SAGBEND	-52.52	-4.70	2.63	-12.331	9.989	132.119	17.68	-.76	45.31	134.91	160.37	44.67
41	SAGBEND	-55.64	-5.26	3.30	-11.681	9.772	135.358	17.60	-.85	53.29	154.42	181.38	50.52
42	SAGBEND	-60.48	-6.09	4.25	-10.535	9.376	140.358	17.49	-.98	63.01	175.40	204.36	56.92
43	SAGBEND	-65.34	-6.89	5.10	-9.277	8.923	145.358	17.39	-1.11	70.41	188.11	218.80	60.95
44	SAGBEND	-70.23	-7.64	5.84	-7.953	8.425	150.358	17.29	-1.23	76.06	195.00	227.22	63.29
45	SAGBEND	-75.14	-8.35	6.46	-6.599	7.894	155.358	17.20	-1.34	80.36	197.77	231.35	64.44
46	SAGBEND	-80.07	-9.01	6.98	-5.239	7.337	160.358	17.12	-1.45	83.60	197.61	232.42	64.74
47	SAGBEND	-85.01	-9.63	7.37	-3.889	6.761	165.358	17.05	-1.55	85.99	195.35	231.26	64.42
48	SAGBEND	-89.97	-10.19	7.65	-2.561	6.171	170.358	16.98	-1.64	87.65	191.50	228.41	63.62
49	SAGBEND	-94.94	-10.70	7.82	-1.267	5.572	175.358	16.92	-1.72	88.69	186.35	224.16	62.44
50	SAGBEND	-99.92	-11.16	7.87	-.013	4.967	180.358	16.86	-1.79	89.12	180.00	218.62	60.90
51	SAGBEND	-104.91	-11.57	7.82	1.193	4.361	185.358	16.82	-1.86	88.94	172.34	211.69	58.97
52	SAGBEND	-109.89	-11.92	7.66	2.339	3.759	190.358	16.78	-1.92	88.08	163.07	203.08	56.57
53	SAGBEND	-114.88	-12.22	7.41	3.414	3.165	195.358	16.74	-1.97	86.43	151.63	192.27	53.56
54	SAGBEND	-119.86	-12.47	7.07	4.401	2.585	200.358	16.72	-2.01	83.78	137.19	178.48	49.72
55	SAGBEND	-124.84	-12.68	6.65	5.276	2.027	205.358	16.70	-2.04	79.84	118.50	160.62	44.74
56	SAGBEND	-129.81	-12.83	6.16	6.003	1.502	210.358	16.69	-2.06	74.19	93.79	137.31	38.25
57	SAGBEND	-134.78	-12.94	5.61	6.534	1.022	215.358	16.68	-2.08	66.22	60.53	107.45	29.93
58	SAGBEND	-139.74	-13.01	5.03	6.821	.607	220.358	16.68	-2.09	55.08	24.57	78.06	21.74
59	SAGBEND	-144.71	-13.05	4.43	6.875	.282	225.358	16.68	-2.10	39.57	-8.64	58.25	16.23
60	SEABED	-149.67	-13.06	3.84	6.705	.078	230.358	16.67	-2.10	20.39	-40.44	63.03	17.56
61	SEABED	-154.64	-13.06	3.27	6.345	-.009	235.358	16.67	-2.10	6.50	-63.26	81.34	22.66
62	SEABED	-159.61	-13.06	2.74	5.866	-.028	240.358	16.67	-2.10	.05	-75.93	93.67	26.09

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
63	SEABED	-164.59	-13.06	2.25	5.326	-.020	245.358	16.67	-2.10	-1.65	-81.81	99.57	27.73
64	SEABED	-169.57	-13.06	1.81	4.759	-.010	250.358	16.67	-2.10	-1.37	-84.14	101.89	28.38
65	SEABED	-174.55	-13.06	1.42	4.183	-.003	255.358	16.67	-2.10	-.70	-84.79	102.53	28.56
66	SEABED	-179.54	-13.06	1.08	3.606	.000	260.358	16.67	-2.10	-.22	-84.50	102.23	28.48
67	SEABED	-184.53	-13.06	.79	3.034	.001	265.358	16.67	-2.10	.00	-83.35	101.08	28.16
68	SEABED	-189.53	-13.06	.55	2.473	.001	270.358	16.67	-2.10	.06	-81.14	98.88	27.54
69	SEABED	-194.52	-13.06	.36	1.931	.000	275.358	16.67	-2.10	.05	-77.54	95.28	26.54
70	SEABED	-199.52	-13.06	.21	1.421	.000	280.358	16.67	-2.10	.02	-72.10	89.84	25.02
71	SEABED	-204.52	-13.06	.11	.955	.000	285.358	16.67	-2.10	.01	-64.18	81.92	22.82
72	SEABED	-209.52	-13.06	.04	.554	.000	290.358	16.67	-2.10	.00	-52.89	70.63	19.67
73	SEABED	-214.52	-13.06	.01	.244	.000	295.358	16.67	-2.10	.00	-36.98	54.73	15.25
74	SEABED	-219.52	-13.06	.00	.059	.000	300.358	16.68	-2.10	.00	-17.88	35.65	9.93
75	SEABED	-224.52	-13.06	-.01	-.014	.000	305.358	16.68	-2.10	.00	-5.03	22.82	6.36
76	SEABED	-229.52	-13.06	.00	-.026	.000	310.358	16.68	-2.10	.00	.53	18.34	5.11
77	SEABED	-234.52	-13.06	.00	-.017	.000	315.358	16.68	-2.10	.00	1.70	19.51	5.43
78	SEABED	-239.52	-13.06	.00	-.007	.000	320.358	16.68	-2.10	.00	1.09	18.90	5.27
79	SEABED	-244.52	-13.06	.00	-.003	.000	325.358	16.68	-2.10	.00	.00	17.82	4.96

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	HORIZ (KN)	SUPT SEPARATIONS VERT (M)	HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	HORIZ (KN-M)	TOTAL (KN-M)
1	LAYBARGE	78.48	6.21	.00	.19	.00	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.38	.00	.00	.00	-.01	.00	.00	.00
5	LAYBARGE	65.95	5.99	.00	.36	.00	.00	.00	-.01	.00	.00	.00
7	LAYBARGE	60.43	5.89	.00	.37	.00	.00	.00	-.02	.00	.00	.00
9	LAYBARGE	53.79	5.78	.00	.39	.00	.00	.00	-.03	.00	.00	.00
11	LAYBARGE	47.73	5.67	.00	.47	.00	.00	.00	-.03	.00	.00	.00
13	TENSIONR	38.54	5.55	.00	1.68	.00	.00	.00	294.16	.00	.00	.00
15	LAYBARGE	29.53	5.36	.00	.00	.00	.01	.00	294.15	.00	.00	.00
17	LAYBARGE	23.33	5.25	.00	1.57	.00	.00	.00	294.14	.00	.00	.00
19	LAYBARGE	17.33	5.11	.00	6.33	.00	.00	.00	294.12	.00	.00	.00
21	LAYBARGE	10.72	4.82	.00	9.54	.00	.00	.00	294.08	.00	.00	.00
24	STINGER	-.89	3.96	.00	10.42	.00	.00	.00	294.02	.00	.00	.00
26	STINGER	-8.31	3.16	.00	6.17	.00	.00	.00	294.00	.00	.00	.00
28	STINGER	-14.42	2.38	.00	9.24	.00	.00	.00	293.93	.00	.00	.00
30	STINGER	-24.80	.74	.00	7.69	-.18	.00	.00	293.85	.00	.00	.00
32	STINGER	-30.75	-.35	.00	7.86	-.73	.00	.00	293.78	.00	.00	.00
34	STINGER	-36.66	-1.59	.00	3.76	-.98	.00	.00	293.73	.00	.00	.00
36	STINGER	-41.25	-2.61	.00	-4.16	-93.90	.00	.00	285.50	.00	.00	.00

38	SAGBEND	-46.03	-3.51	1.15	.00	.00	.00	.00	284.83	34.83	108.89	114.32
39	SAGBEND	-49.27	-4.11	1.90	.00	.00	.00	.00	284.33	53.03	161.88	170.35
40	SAGBEND	-52.52	-4.70	2.63	.00	.00	.00	.00	283.83	67.93	202.27	213.37
41	SAGBEND	-55.64	-5.26	3.30	.00	.00	.00	.00	283.36	79.90	231.52	244.92
42	SAGBEND	-60.48	-6.09	4.25	.00	.00	.00	.00	282.70	94.48	262.97	279.43
43	SAGBEND	-65.34	-6.89	5.10	.00	.00	.00	.00	282.10	105.57	282.04	301.15
44	SAGBEND	-70.23	-7.64	5.84	.00	.00	.00	.00	281.57	114.04	292.36	313.82
45	SAGBEND	-75.14	-8.35	6.46	.00	.00	.00	.00	281.09	120.49	296.51	320.06
46	SAGBEND	-80.07	-9.01	6.98	.00	.00	.00	.00	280.67	125.34	296.28	321.70
47	SAGBEND	-85.01	-9.63	7.37	.00	.00	.00	.00	280.30	128.92	292.89	320.00
48	SAGBEND	-89.97	-10.19	7.65	.00	.00	.00	.00	279.97	131.42	287.11	315.76
49	SAGBEND	-94.94	-10.70	7.82	.00	.00	.00	.00	279.68	132.97	279.40	309.42
50	SAGBEND	-99.92	-11.16	7.87	.00	.00	.00	.00	279.43	133.61	269.87	301.14
51	SAGBEND	-104.91	-11.57	7.82	.00	.00	.00	.00	279.23	133.34	258.39	290.77
52	SAGBEND	-109.89	-11.92	7.66	.00	.00	.00	.00	279.06	132.06	244.48	277.87
53	SAGBEND	-114.88	-12.22	7.41	.00	.00	.00	.00	278.94	129.58	227.34	261.68
54	SAGBEND	-119.86	-12.47	7.07	.00	.00	.00	.00	278.87	125.61	205.69	241.01
55	SAGBEND	-124.84	-12.68	6.65	.00	.00	.00	.00	278.84	119.71	177.67	214.23
56	SAGBEND	-129.81	-12.83	6.16	.00	.00	.00	.00	278.85	111.23	140.61	179.29
57	SAGBEND	-134.78	-12.94	5.61	.00	.00	.00	.00	278.90	99.28	90.75	134.51
58	SAGBEND	-139.74	-13.01	5.03	.00	.00	.00	.00	278.93	82.58	36.84	90.43
59	SAGBEND	-144.71	-13.05	4.43	.64	-.61	.00	.00	278.94	59.32	-12.95	60.72
60	SEABED	-149.67	-13.06	3.84	4.09	-4.09	.00	.00	278.93	30.57	-60.62	67.89
61	SEABED	-154.64	-13.06	3.27	5.15	-5.15	.00	.00	278.90	9.74	-94.85	95.35
62	SEABED	-159.61	-13.06	2.74	4.54	-4.54	.00	.00	278.87	.07	-113.85	113.85

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
63	SEABED	-164.59	-13.06	2.25	3.76	-3.76	.00	.00	278.85	-2.47	-122.66	122.69
64	SEABED	-169.57	-13.06	1.81	3.28	-3.28	.00	.00	278.84	-2.05	-126.16	126.17
65	SEABED	-174.55	-13.06	1.42	3.09	-3.09	.00	.00	278.84	-1.05	-127.13	127.14
66	SEABED	-179.54	-13.06	1.08	3.06	-3.06	.00	.00	278.84	-.33	-126.69	126.69
67	SEABED	-184.53	-13.06	.79	3.08	-3.08	.00	.00	278.84	.00	-124.97	124.97
68	SEABED	-189.53	-13.06	.55	3.10	-3.10	.00	.00	278.85	.09	-121.66	121.66
69	SEABED	-194.52	-13.06	.36	3.12	-3.12	.00	.00	278.86	.07	-116.26	116.26
70	SEABED	-199.52	-13.06	.21	3.13	-3.13	.00	.00	278.87	.04	-108.10	108.10
71	SEABED	-204.52	-13.06	.11	3.13	-3.13	.00	.00	278.89	.01	-96.22	96.22
72	SEABED	-209.52	-13.06	.04	3.13	-3.13	.00	.00	278.92	.00	-79.29	79.29
73	SEABED	-214.52	-13.06	.01	3.13	-2.25	.00	.00	278.94	.00	-55.44	55.44
74	SEABED	-219.52	-13.06	.00	3.13	1.33	.00	.00	278.96	.00	-26.81	26.81
75	SEABED	-224.52	-13.06	-.01	3.13	2.03	.00	.00	278.96	.00	-7.53	7.53
76	SEABED	-229.52	-13.06	.00	3.13	1.32	.00	.00	278.96	.00	.79	.79
77	SEABED	-234.52	-13.06	.00	3.13	.58	.00	.00	278.96	.00	2.55	2.55
78	SEABED	-239.52	-13.06	.00	3.13	.17	.00	.00	278.96	.00	1.63	1.63
79	SEABED	-244.52	-13.06	.00	.00	.02	.00	.00	278.96	.00	.00	.00

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	BENDING STRESSES HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
1	LAYBARGE	78.48	6.21	.00	.000	.991	.000	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.000	.997	6.361	.00	.00	.00	.00	.00	.00
5	LAYBARGE	65.95	5.99	.00	.000	1.005	12.532	.00	.00	.00	.00	.00	.00
7	LAYBARGE	60.43	5.89	.00	.000	1.004	18.053	.00	.00	.00	.00	.00	.00
9	LAYBARGE	53.79	5.78	.00	.000	1.001	24.694	.00	.00	.00	.00	.00	.00
11	LAYBARGE	47.73	5.67	.00	.000	.875	30.755	.00	.00	.00	.00	.00	.00
13	TENSIONR	38.54	5.55	.00	.000	.967	39.945	.00	.00	.00	.00	.00	.00
15	LAYBARGE	29.53	5.36	.00	.000	1.140	48.958	.00	.00	.00	.00	.00	.00
17	LAYBARGE	23.33	5.25	.00	.000	1.212	55.159	.00	.00	.00	.00	.00	.00
19	LAYBARGE	17.33	5.11	.00	.000	1.907	61.160	.00	.00	.00	.00	.00	.00
21	LAYBARGE	10.72	4.82	.00	.000	3.361	67.777	.00	.00	.00	.00	.00	.00
24	STINGER	-.89	3.96	.00	.000	5.195	79.419	.00	.00	.00	.00	.00	.00
26	STINGER	-8.31	3.16	.00	.000	6.714	86.882	.00	.00	.00	.00	.00	.00
28	STINGER	-14.42	2.38	.00	.000	8.127	93.042	.00	.00	.00	.00	.00	.00
30	STINGER	-24.80	.74	.00	.000	9.462	103.551	.00	.00	.00	.00	.00	.00
32	STINGER	-30.76	-.30	.00	.000	9.913	109.600	.00	.00	.00	.00	.00	.00
34	STINGER	-36.71	-1.34	.00	.008	9.853	115.639	.00	.00	.00	.00	.00	.00
36	STINGER	-41.34	-2.14	.00	-5.535	9.730	120.343	.00	.00	.00	.00	.00	.00
38	SAGBEND	-44.53	-2.69	.62	-11.028	9.535	123.645	.00	.00	.00	.00	.00	.00
39	SAGBEND	-47.73	-3.24	1.24	-10.924	9.504	126.945	.00	.00	.00	.00	.00	.00
40	SAGBEND	-50.93	-3.78	1.86	-10.823	9.474	130.245	.00	.00	.00	.00	.00	.00
41	SAGBEND	-54.12	-4.32	2.47	-10.724	9.443	133.546	.00	.00	.00	.00	.00	.00
42	SAGBEND	-57.32	-4.86	3.07	-10.625	9.411	136.846	.00	.00	.00	.00	.00	.00
43	SAGBEND	-60.52	-5.40	3.67	-10.514	9.373	140.146	.00	.00	.00	.00	.00	.00
44	SAGBEND	-63.72	-5.94	4.26	-10.322	9.302	143.446	.00	.00	.00	.00	.00	.00
45	SAGBEND	-66.93	-6.47	4.84	-9.641	9.038	146.746	.00	.00	.00	.00	.00	.00
46	SAGBEND	-70.14	-7.00	5.40	-6.107	7.630	150.046	18.05	-1.13	2.23	5.46	24.52	6.83
47	SAGBEND	-73.39	-7.43	5.75	-5.986	7.581	153.346	17.99	-1.20	19.20	46.42	68.83	19.17
48	SAGBEND	-76.64	-7.87	6.08	-5.700	7.463	156.646	17.93	-1.26	32.83	78.17	103.35	28.79
49	SAGBEND	-79.90	-8.29	6.40	-5.288	7.290	159.946	17.87	-1.33	43.82	102.58	130.09	36.24
50	SAGBEND	-83.16	-8.70	6.68	-4.779	7.073	163.246	17.81	-1.40	52.68	121.14	150.62	41.96
51	SAGBEND	-86.43	-9.10	6.94	-4.197	6.820	166.546	17.76	-1.46	59.83	135.04	166.20	46.30
52	SAGBEND	-89.70	-9.49	7.16	-3.562	6.538	169.846	17.71	-1.53	65.60	145.21	177.82	49.53
53	SAGBEND	-92.97	-9.85	7.35	-2.888	6.232	173.146	17.66	-1.58	70.23	152.40	186.26	51.88
54	SAGBEND	-96.25	-10.20	7.49	-2.187	5.909	176.446	17.62	-1.64	73.91	157.17	192.12	53.52
55	SAGBEND	-99.53	-10.53	7.60	-1.470	5.570	179.746	17.58	-1.69	76.82	159.96	195.88	54.56
56	SAGBEND	-102.82	-10.84	7.66	-.744	5.220	183.046	17.54	-1.74	79.06	161.11	197.88	55.12
57	SAGBEND	-106.11	-11.13	7.68	-.017	4.861	186.346	17.51	-1.79	80.72	160.86	198.39	55.26
58	SAGBEND	-109.39	-11.40	7.66	.706	4.496	189.646	17.48	-1.83	81.87	159.37	197.57	55.03
59	SAGBEND	-112.68	-11.65	7.60	1.418	4.126	192.946	17.45	-1.87	82.54	156.71	195.51	54.46
60	SAGBEND	-115.97	-11.88	7.50	2.117	3.755	196.246	17.43	-1.91	82.76	152.91	192.26	53.55
61	SAGBEND	-119.27	-12.08	7.36	2.794	3.384	199.546	17.41	-1.94	82.54	147.90	187.76	52.30

62	SAGBEND	-122.56	-12.27	7.18	3.447	3.014	202.846	17.40	-1.97	81.85	141.57	181.92	50.67
63	SAGBEND	-125.84	-12.43	6.96	4.067	2.649	206.146	17.38	-2.00	80.65	133.71	174.54	48.62

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	BENDING STRESSES HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
64	SAGBEND	-129.13	-12.57	6.71	4.647	2.290	209.446	17.37	-2.02	78.88	124.03	165.38	46.07
65	SAGBEND	-132.42	-12.69	6.43	5.180	1.941	212.746	17.36	-2.04	76.45	112.15	154.12	42.93
66	SAGBEND	-135.70	-12.80	6.12	5.652	1.604	216.046	17.36	-2.06	73.26	97.54	140.38	39.10
67	SAGBEND	-138.98	-12.88	5.78	6.052	1.284	219.346	17.35	-2.07	69.13	79.55	123.79	34.48
68	SAGBEND	-142.26	-12.94	5.42	6.361	.985	222.646	17.34	-2.08	63.88	57.33	104.23	29.03
69	SAGBEND	-145.54	-12.99	5.05	6.565	.712	225.946	17.34	-2.09	57.26	33.89	84.93	23.66
70	SAGBEND	-148.82	-13.03	4.67	6.668	.472	229.246	17.33	-2.09	48.93	12.14	68.82	19.17
71	SAGBEND	-152.10	-13.05	4.29	6.675	.275	232.546	17.32	-2.10	38.50	-8.99	57.94	16.14
72	SEABED	-155.37	-13.06	3.91	6.587	.130	235.846	17.31	-2.10	26.04	-29.95	58.07	16.18
73	SEABED	-158.65	-13.06	3.53	6.411	.039	239.146	17.30	-2.10	14.71	-48.01	68.60	19.11
74	SEABED	-161.93	-13.06	3.17	6.163	-.007	242.446	17.30	-2.10	6.56	-61.50	80.22	22.35
75	SEABED	-165.21	-13.06	2.83	5.864	-.025	245.746	17.30	-2.10	1.64	-70.59	88.98	24.78
76	SEABED	-168.50	-13.06	2.50	5.533	-.026	249.046	17.29	-2.10	-.77	-76.24	94.61	26.35
77	SEABED	-171.78	-13.06	2.19	5.182	-.020	252.346	17.29	-2.10	-1.57	-79.50	97.88	27.26
78	SEABED	-175.07	-13.06	1.90	4.820	-.013	255.646	17.29	-2.10	-1.53	-81.26	99.63	27.75
79	SEABED	-178.36	-13.06	1.63	4.453	-.007	258.946	17.29	-2.10	-1.15	-82.10	100.47	27.99
80	SEABED	-181.65	-13.06	1.39	4.083	-.003	262.246	17.29	-2.10	-.72	-82.39	100.76	28.07
81	SEABED	-184.94	-13.06	1.16	3.713	.000	265.546	17.29	-2.10	-.37	-82.30	100.66	28.04
82	SEABED	-188.24	-13.06	.96	3.344	.001	268.846	17.29	-2.10	-.14	-81.86	100.22	27.92
83	SEABED	-191.53	-13.06	.78	2.977	.001	272.146	17.29	-2.10	-.01	-81.05	99.41	27.69
84	SEABED	-194.83	-13.06	.62	2.616	.001	275.446	17.29	-2.10	.04	-79.82	98.18	27.35
85	SEABED	-198.13	-13.06	.48	2.261	.001	278.746	17.29	-2.10	.06	-78.06	96.43	26.86
86	SEABED	-201.42	-13.06	.36	1.915	.000	282.046	17.29	-2.10	.05	-75.68	94.04	26.20
87	SEABED	-204.72	-13.06	.26	1.581	.000	285.346	17.30	-2.10	.03	-72.54	90.90	25.32
88	SEABED	-208.02	-13.06	.18	1.264	.000	288.646	17.30	-2.10	.02	-68.47	86.83	24.19
89	SEABED	-211.32	-13.06	.11	.967	.000	291.946	17.30	-2.10	.01	-63.26	81.63	22.74
90	SEABED	-214.62	-13.06	.06	.697	.000	295.246	17.30	-2.10	.00	-56.66	75.03	20.90
91	SEABED	-217.92	-13.06	.03	.460	.000	298.546	17.30	-2.10	.00	-48.33	66.71	18.58
92	SEABED	-221.22	-13.06	.01	.266	.000	301.846	17.30	-2.10	.00	-37.87	56.24	15.67
93	SEABED	-224.52	-13.06	.00	.123	.000	305.146	17.30	-2.10	.00	-25.46	43.84	12.21
94	SEABED	-227.82	-13.06	-.01	.035	.000	308.446	17.30	-2.10	.00	-14.42	32.82	9.14
95	SEABED	-231.12	-13.06	-.01	-.012	.000	311.746	17.30	-2.10	.00	-6.75	25.17	7.01
96	SEABED	-234.42	-13.06	.00	-.031	.000	315.046	17.30	-2.10	.00	-2.45	20.88	5.82
97	SEABED	-237.72	-13.06	.00	-.037	.000	318.346	17.30	-2.10	.00	-.60	19.03	5.30
98	SEABED	-241.02	-13.06	.00	-.038	.000	321.646	17.30	-2.10	.00	.00	18.44	5.14

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
1	LAYBARGE	78.48	6.21	.00	.19	.00	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.38	.00	.00	.00	-.01	.00	.00	.00
5	LAYBARGE	65.95	5.99	.00	.36	.00	.00	.00	-.01	.00	.00	.00
7	LAYBARGE	60.43	5.89	.00	.37	.00	.00	.00	-.02	.00	.00	.00
9	LAYBARGE	53.79	5.78	.00	.39	.00	.00	.00	-.03	.00	.00	.00
11	LAYBARGE	47.73	5.67	.00	.47	.00	.00	.00	-.03	.00	.00	.00
13	TENSIONR	38.54	5.55	.00	1.68	.00	.00	.00	294.12	.00	.00	.00
15	LAYBARGE	29.53	5.36	.00	.00	.00	.01	.00	294.11	.00	.00	.00
17	LAYBARGE	23.33	5.25	.00	1.57	.00	.00	.00	294.11	.00	.00	.00
19	LAYBARGE	17.33	5.11	.00	6.33	.00	.00	.00	294.08	.00	.00	.00
21	LAYBARGE	10.72	4.82	.00	9.54	.00	.00	.00	294.04	.00	.00	.00
24	STINGER	-.89	3.96	.00	10.42	.00	.00	.00	293.98	.00	.00	.00
26	STINGER	-8.31	3.16	.00	6.17	.00	.00	.00	293.96	.00	.00	.00
28	STINGER	-14.42	2.38	.00	9.24	.00	.00	.00	293.90	.00	.00	.00
30	STINGER	-24.80	.74	.00	5.40	-.17	.00	.00	294.00	.00	.00	.00
32	STINGER	-30.76	-.30	.00	.00	-.72	.05	.00	293.95	.00	.00	.00
34	STINGER	-36.71	-1.34	.00	.00	-.89	.25	.00	293.89	.00	.00	.00
36	STINGER	-41.34	-2.14	.00	-1.28	-59.56	.48	.00	293.45	.00	.00	.00
38	SAGBEND	-44.53	-2.69	.62	.00	.00	.00	.00	294.76	.00	.00	.00
39	SAGBEND	-47.73	-3.24	1.24	.00	.00	.00	.00	294.70	.00	.00	.00
40	SAGBEND	-50.93	-3.78	1.86	.00	.00	.00	.00	294.65	.00	.00	.00
41	SAGBEND	-54.12	-4.32	2.47	.00	.00	.00	.00	294.60	.00	.00	.00
42	SAGBEND	-57.32	-4.86	3.07	.00	.00	.00	.00	294.54	.00	.01	.00
43	SAGBEND	-60.52	-5.40	3.67	.00	.00	.00	.00	294.49	.02	.04	.00
44	SAGBEND	-63.72	-5.94	4.26	.00	.00	.00	.00	294.42	.10	.24	.00
45	SAGBEND	-66.93	-6.47	4.84	.00	.00	.00	.00	294.25	.56	1.41	.00
46	SAGBEND	-70.14	-7.00	5.40	.00	.00	.00	.00	292.58	3.34	8.19	8.84
47	SAGBEND	-73.39	-7.43	5.75	.00	.00	.00	.00	292.26	28.78	69.60	75.31
48	SAGBEND	-76.64	-7.87	6.08	.00	.00	.00	.00	291.90	49.23	117.20	127.12
49	SAGBEND	-79.90	-8.29	6.40	.00	.00	.00	.00	291.53	65.70	153.80	167.24
50	SAGBEND	-83.16	-8.70	6.68	.00	.00	.00	.00	291.17	78.99	181.63	198.06
51	SAGBEND	-86.43	-9.10	6.94	.00	.00	.00	.00	290.83	89.71	202.47	221.45
52	SAGBEND	-89.70	-9.49	7.16	.00	.00	.00	.00	290.53	98.35	217.72	238.90
53	SAGBEND	-92.97	-9.85	7.35	.00	.00	.00	.00	290.25	105.29	228.49	251.58
54	SAGBEND	-96.25	-10.20	7.49	.00	.00	.00	.00	290.02	110.82	235.64	260.40
55	SAGBEND	-99.53	-10.53	7.60	.00	.00	.00	.00	289.81	115.17	239.83	266.05
56	SAGBEND	-102.82	-10.84	7.66	.00	.00	.00	.00	289.64	118.53	241.56	269.07
57	SAGBEND	-106.11	-11.13	7.68	.00	.00	.00	.00	289.51	121.02	241.18	269.84
58	SAGBEND	-109.39	-11.40	7.66	.00	.00	.00	.00	289.40	122.74	238.94	268.62
59	SAGBEND	-112.68	-11.65	7.60	.00	.00	.00	.00	289.32	123.75	234.96	265.55
60	SAGBEND	-115.97	-11.88	7.50	.00	.00	.00	.00	289.27	124.09	229.25	260.68
61	SAGBEND	-119.27	-12.08	7.36	.00	.00	.00	.00	289.25	123.75	221.75	253.94
62	SAGBEND	-122.56	-12.27	7.18	.00	.00	.00	.00	289.24	122.71	212.25	245.17
63	SAGBEND	-125.84	-12.43	6.96	.00	.00	.00	.00	289.25	120.91	200.47	234.11

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
64	SAGBEND	-129.13	-12.57	6.71	.00	.00	.00	.00	289.26	118.26	185.96	220.38
65	SAGBEND	-132.42	-12.69	6.43	.00	.00	.00	.00	289.29	114.63	168.14	203.50
66	SAGBEND	-135.70	-12.80	6.12	.00	.00	.00	.00	289.31	109.84	146.24	182.90
67	SAGBEND	-138.98	-12.88	5.78	.00	.00	.00	.00	289.32	103.65	119.27	158.01
68	SAGBEND	-142.26	-12.94	5.42	.00	.00	.00	.00	289.30	95.78	85.95	128.69
69	SAGBEND	-145.54	-12.99	5.05	.00	.00	.00	.00	289.25	85.84	50.81	99.75
70	SAGBEND	-148.82	-13.03	4.67	.00	.00	.00	.00	289.16	73.37	18.21	75.59
71	SAGBEND	-152.10	-13.05	4.29	.24	-.23	.00	.00	289.04	57.73	-13.48	59.28
72	SEABED	-155.37	-13.06	3.91	2.01	-2.02	.00	.00	288.92	39.04	-44.90	59.50
73	SEABED	-158.65	-13.06	3.53	3.18	-3.18	.00	.00	288.83	22.06	-71.99	75.29
74	SEABED	-161.93	-13.06	3.17	3.39	-3.39	.00	.00	288.76	9.83	-92.21	92.73
75	SEABED	-165.21	-13.06	2.83	3.16	-3.16	.00	.00	288.72	2.46	-105.84	105.87
76	SEABED	-168.50	-13.06	2.50	2.80	-2.80	.00	.00	288.69	-1.15	-114.31	114.31
77	SEABED	-171.78	-13.06	2.19	2.48	-2.48	.00	.00	288.67	-2.36	-119.20	119.22
78	SEABED	-175.07	-13.06	1.90	2.25	-2.25	.00	.00	288.66	-2.29	-121.83	121.85
79	SEABED	-178.36	-13.06	1.63	2.11	-2.11	.00	.00	288.65	-1.72	-123.10	123.11
80	SEABED	-181.65	-13.06	1.39	2.04	-2.04	.00	.00	288.65	-1.07	-123.53	123.54
81	SEABED	-184.94	-13.06	1.16	2.02	-2.02	.00	.00	288.65	-.55	-123.39	123.39
82	SEABED	-188.24	-13.06	.96	2.02	-2.02	.00	.00	288.65	-.21	-122.73	122.73
83	SEABED	-191.53	-13.06	.78	2.03	-2.03	.00	.00	288.66	-.02	-121.52	121.52
84	SEABED	-194.83	-13.06	.62	2.04	-2.04	.00	.00	288.66	.07	-119.67	119.67
85	SEABED	-198.13	-13.06	.48	2.05	-2.05	.00	.00	288.67	.08	-117.04	117.04
86	SEABED	-201.42	-13.06	.36	2.06	-2.06	.00	.00	288.69	.07	-113.47	113.47
87	SEABED	-204.72	-13.06	.26	2.06	-2.06	.00	.00	288.70	.05	-108.76	108.76
88	SEABED	-208.02	-13.06	.18	2.06	-2.06	.00	.00	288.71	.03	-102.65	102.65
89	SEABED	-211.32	-13.06	.11	2.06	-2.06	.00	.00	288.73	.01	-94.85	94.85
90	SEABED	-214.62	-13.06	.06	2.06	-2.06	.00	.00	288.74	.00	-84.95	84.95
91	SEABED	-217.92	-13.06	.03	2.06	-2.06	.00	.00	288.75	.00	-72.47	72.47
92	SEABED	-221.22	-13.06	.01	2.06	-1.78	.00	.00	288.76	.00	-56.77	56.77
93	SEABED	-224.52	-13.06	.00	2.06	.07	.00	.00	288.76	.00	-38.17	38.17
94	SEABED	-227.82	-13.06	-.01	2.06	1.22	.00	.00	288.77	.00	-21.62	21.62
95	SEABED	-231.12	-13.06	-.01	2.06	1.38	.00	.00	288.77	.00	-10.13	10.13
96	SEABED	-234.42	-13.06	.00	2.06	1.06	.00	.00	288.77	.00	-3.67	3.67
97	SEABED	-237.72	-13.06	.00	2.06	.55	.00	.00	288.77	.00	-.90	.90
98	SEABED	-241.02	-13.06	.00	.00	.08	.00	.00	288.77	.00	.00	.00

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	BENDING STRESSES HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
1	LAYBARGE	78.48	6.21	.00	.000	.991	.000	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.000	.997	6.361	.00	.00	.00	.00	.00	.00
5	LAYBARGE	65.95	5.99	.00	.000	1.005	12.532	.00	.00	.00	.00	.00	.00
7	LAYBARGE	60.43	5.89	.00	.000	1.004	18.053	.00	.00	.00	.00	.00	.00
9	LAYBARGE	53.79	5.78	.00	.000	1.001	24.694	.00	.00	.00	.00	.00	.00
11	LAYBARGE	47.73	5.67	.00	.000	.875	30.755	.00	.00	.00	.00	.00	.00
13	TENSIONR	38.54	5.55	.00	.000	.967	39.945	.00	.00	.00	.00	.00	.00
15	LAYBARGE	29.53	5.36	.00	.000	1.140	48.958	.00	.00	.00	.00	.00	.00
17	LAYBARGE	23.33	5.25	.00	.000	1.212	55.159	.00	.00	.00	.00	.00	.00
19	LAYBARGE	17.33	5.11	.00	.000	1.907	61.160	.00	.00	.00	.00	.00	.00
21	LAYBARGE	10.72	4.82	.00	.000	3.361	67.777	.00	.00	.00	.00	.00	.00
24	STINGER	-.89	3.96	.00	.000	5.195	79.419	.00	.00	.00	.00	.00	.00
26	STINGER	-8.31	3.16	.00	.000	6.714	86.882	.00	.00	.00	.00	.00	.00
28	STINGER	-14.42	2.38	.00	.000	7.778	93.042	.00	.00	.00	.00	.00	.00
30	STINGER	-24.82	.87	.00	.000	8.232	103.551	.00	.00	.00	.00	.00	.00
32	STINGER	-30.81	.01	.00	.000	8.150	109.600	.00	.00	.00	.00	.00	.00
34	STINGER	-36.77	-.85	.00	.034	8.089	115.627	.00	.00	.00	.00	.00	.00
36	STINGER	-41.41	-1.50	-.01	-3.599	8.005	120.310	.00	.00	.00	.00	.00	.00
38	SAGBEND	-44.68	-1.96	.41	-7.209	7.902	123.642	.00	.00	.00	.00	.00	.00
39	SAGBEND	-47.93	-2.41	.82	-7.100	7.870	126.942	.00	.00	.00	.00	.00	.00
40	SAGBEND	-51.17	-2.86	1.22	-6.992	7.838	130.243	.00	.00	.00	.00	.00	.00
41	SAGBEND	-54.42	-3.31	1.61	-6.887	7.806	133.543	.00	.00	.00	.00	.00	.00
42	SAGBEND	-57.66	-3.76	2.00	-6.784	7.774	136.843	.00	.00	.00	.00	.00	.00
43	SAGBEND	-60.91	-4.21	2.39	-6.684	7.741	140.143	.00	.00	.00	.00	.00	.00
44	SAGBEND	-64.16	-4.65	2.77	-6.586	7.709	143.443	.00	.00	.00	.00	.00	.00
45	SAGBEND	-67.41	-5.09	3.14	-6.490	7.676	146.743	.00	.00	.00	.00	.00	.00
46	SAGBEND	-70.66	-5.53	3.50	-6.396	7.644	150.043	.00	.00	.00	.00	.00	.00
47	SAGBEND	-73.91	-5.97	3.87	-6.305	7.611	153.343	.00	.00	.00	.00	.00	.00
48	SAGBEND	-77.16	-6.41	4.22	-6.216	7.579	156.643	.00	.00	.00	.00	.00	.00
49	SAGBEND	-80.41	-6.84	4.57	-6.128	7.546	159.943	.00	.00	.00	.00	.00	.00
50	SAGBEND	-83.66	-7.27	4.92	-6.043	7.513	163.243	.00	.00	.00	.00	.00	.00
51	SAGBEND	-86.92	-7.70	5.26	-5.957	7.479	166.543	.00	.00	.00	.00	.00	.00
52	SAGBEND	-90.17	-8.13	5.60	-5.861	7.439	169.843	.00	.00	.00	.00	.00	.00
53	SAGBEND	-93.43	-8.56	5.93	-5.693	7.365	173.143	.00	.00	.00	.00	.00	.00
54	SAGBEND	-96.68	-8.98	6.26	-5.098	7.093	176.443	.00	.00	.00	.00	.00	.00
55	SAGBEND	-99.94	-9.40	6.56	-2.012	5.650	179.743	17.85	-1.51	2.27	4.79	23.94	6.67
56	SAGBEND	-103.23	-9.72	6.68	-1.905	5.600	183.043	17.81	-1.56	19.51	40.72	63.75	17.76
57	SAGBEND	-106.51	-10.04	6.78	-1.656	5.480	186.343	17.76	-1.61	33.27	68.52	94.75	26.39
58	SAGBEND	-109.79	-10.35	6.86	-1.296	5.305	189.643	17.72	-1.66	44.24	89.81	118.68	33.06
59	SAGBEND	-113.08	-10.65	6.93	-.853	5.086	192.943	17.68	-1.71	52.96	105.84	136.89	38.13
60	SAGBEND	-116.37	-10.93	6.96	-.347	4.832	196.243	17.64	-1.76	59.84	117.61	150.48	41.92
61	SAGBEND	-119.66	-11.20	6.96	.203	4.551	199.543	17.60	-1.80	65.23	125.87	160.28	44.65
62	SAGBEND	-122.95	-11.46	6.94	.784	4.248	202.843	17.57	-1.84	69.36	131.21	166.91	46.49
63	SAGBEND	-126.24	-11.69	6.87	1.382	3.929	206.143	17.54	-1.88	72.43	134.04	170.85	47.59

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
64	SAGBEND	-129.53	-11.91	6.78	1.988	3.599	209.443	17.51	-1.91	74.58	134.65	172.41	48.02
65	SAGBEND	-132.82	-12.11	6.65	2.592	3.261	212.743	17.49	-1.95	75.91	133.21	171.79	47.85
66	SAGBEND	-136.11	-12.28	6.48	3.185	2.918	216.043	17.47	-1.98	76.47	129.75	169.07	47.09
67	SAGBEND	-139.40	-12.44	6.28	3.757	2.575	219.343	17.45	-2.00	76.29	124.22	164.23	45.75
68	SAGBEND	-142.69	-12.58	6.05	4.299	2.234	222.643	17.43	-2.02	75.34	116.43	157.14	43.77
69	SAGBEND	-145.98	-12.70	5.79	4.801	1.899	225.943	17.42	-2.04	73.60	106.08	147.57	41.11
70	SAGBEND	-149.26	-12.80	5.50	5.249	1.573	229.243	17.41	-2.06	70.96	92.74	135.23	37.67
71	SAGBEND	-152.55	-12.88	5.18	5.630	1.262	232.543	17.41	-2.07	67.31	75.79	119.82	33.38
72	SAGBEND	-155.83	-12.94	4.85	5.924	.970	235.843	17.40	-2.08	62.45	54.44	101.31	28.22
73	SAGBEND	-159.11	-12.99	4.50	6.117	.703	239.143	17.40	-2.09	56.17	31.73	82.98	23.11
74	SAGBEND	-162.39	-13.03	4.15	6.212	.468	242.443	17.40	-2.09	48.15	10.62	67.78	18.88
75	SAGBEND	-165.67	-13.05	3.79	6.213	.273	245.743	17.40	-2.10	38.00	-9.96	57.76	16.09
76	SEABED	-168.95	-13.06	3.44	6.122	.130	249.043	17.40	-2.10	25.79	-30.44	58.37	16.26
77	SEABED	-172.23	-13.06	3.09	5.944	.040	252.343	17.39	-2.10	14.63	-48.14	68.78	19.16
78	SEABED	-175.52	-13.06	2.76	5.696	-.007	255.643	17.39	-2.10	6.56	-61.35	80.17	22.33
79	SEABED	-178.80	-13.06	2.44	5.399	-.024	258.943	17.39	-2.10	1.69	-70.24	88.72	24.71
80	SEABED	-182.09	-13.06	2.13	5.069	-.026	262.243	17.39	-2.10	-.72	-75.71	94.17	26.23
81	SEABED	-185.38	-13.06	1.85	4.721	-.020	265.543	17.39	-2.10	-1.53	-78.81	97.28	27.10
82	SEABED	-188.67	-13.06	1.59	4.363	-.013	268.843	17.39	-2.10	-1.50	-80.39	98.87	27.54
83	SEABED	-191.96	-13.06	1.35	4.000	-.007	272.143	17.39	-2.10	-1.13	-81.05	99.51	27.72
84	SEABED	-195.25	-13.06	1.13	3.635	-.003	275.443	17.39	-2.10	-.71	-81.11	99.57	27.74
85	SEABED	-198.54	-13.06	.93	3.271	.000	278.743	17.39	-2.10	-.37	-80.74	99.20	27.63
86	SEABED	-201.84	-13.06	.75	2.910	.001	282.043	17.39	-2.10	-.14	-79.97	98.43	27.42
87	SEABED	-205.14	-13.06	.60	2.553	.001	285.343	17.39	-2.10	-.01	-78.76	97.21	27.08
88	SEABED	-208.43	-13.06	.46	2.203	.001	288.643	17.39	-2.10	.04	-77.02	95.48	26.60
89	SEABED	-211.73	-13.06	.34	1.862	.001	291.943	17.39	-2.10	.06	-74.64	93.10	25.93
90	SEABED	-215.03	-13.06	.25	1.533	.000	295.243	17.39	-2.10	.05	-71.49	89.95	25.06
91	SEABED	-218.33	-13.06	.17	1.220	.000	298.543	17.39	-2.10	.03	-67.38	85.84	23.91
92	SEABED	-221.63	-13.06	.11	.929	.000	301.843	17.39	-2.10	.02	-62.11	80.57	22.44
93	SEABED	-224.93	-13.06	.06	.664	.000	305.143	17.39	-2.10	.01	-55.39	73.86	20.57
94	SEABED	-228.23	-13.06	.03	.433	.000	308.443	17.40	-2.10	.00	-46.91	65.38	18.21
95	SEABED	-231.53	-13.06	.01	.246	.000	311.743	17.40	-2.10	.00	-36.22	54.70	15.24
96	SEABED	-234.83	-13.06	.00	.110	.000	315.043	17.40	-2.10	.00	-23.88	42.36	11.80
97	SEABED	-238.13	-13.06	-.01	.028	.000	318.343	17.40	-2.10	.00	-13.24	31.74	8.84
98	SEABED	-241.43	-13.06	-.01	-.014	.000	321.643	17.40	-2.10	.00	-6.01	24.52	6.83
99	SEABED	-244.73	-13.06	.00	-.031	.000	324.943	17.40	-2.10	.00	-2.04	20.57	5.73
100	SEABED	-248.03	-13.06	.00	-.036	.000	328.243	17.40	-2.10	.00	-.43	18.96	5.28
101	SEABED	-251.33	-13.06	.00	-.036	.000	331.543	17.40	-2.10	.00	.00	18.54	5.16

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	HORIZ (KN)	SUPT SEPARATIONS VERT (M)	HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	HORIZ (KN-M)	TOTAL (KN-M)
1	LAYBARGE	78.48	6.21	.00	.19	.00	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.38	.00	.00	.00	-.01	.00	.00	.00
5	LAYBARGE	65.95	5.99	.00	.36	.00	.00	.00	-.01	.00	.00	.00
7	LAYBARGE	60.43	5.89	.00	.37	.00	.00	.00	-.02	.00	.00	.00
9	LAYBARGE	53.79	5.78	.00	.39	.00	.00	.00	-.03	.00	.00	.00
11	LAYBARGE	47.73	5.67	.00	.47	.00	.00	.00	-.03	.00	.00	.00
13	TENSIONR	38.54	5.55	.00	1.68	.00	.00	.00	294.16	.00	.00	.00
15	LAYBARGE	29.53	5.36	.00	.00	.00	.01	.00	294.15	.00	.00	.00
17	LAYBARGE	23.33	5.25	.00	1.57	.00	.00	.00	294.14	.00	.00	.00
19	LAYBARGE	17.33	5.11	.00	6.33	.00	.00	.00	294.11	.00	.00	.00
21	LAYBARGE	10.72	4.82	.00	9.54	.00	.00	.00	294.08	.00	.00	.00
24	STINGER	-.89	3.96	.00	10.42	.00	.00	.00	294.02	.00	.00	.00
26	STINGER	-8.31	3.16	.00	6.17	.00	.00	.00	294.00	.00	.00	.00
28	STINGER	-14.42	2.38	.00	5.66	.00	.00	.00	293.95	.00	.00	.00
30	STINGER	-24.82	.87	.00	.00	.00	.13	.00	293.87	.00	.00	.00
32	STINGER	-30.81	.01	.00	.00	-.56	.36	.00	293.82	.00	.00	.00
34	STINGER	-36.77	-.85	.00	.00	-.63	.76	.00	293.78	.00	.00	.00
36	STINGER	-41.41	-1.50	-.01	-.53	-37.92	1.12	.00	293.12	.00	.00	.00
38	SAGBEND	-44.68	-1.96	.41	.00	.00	.00	.00	293.71	.00	.00	.00
39	SAGBEND	-47.93	-2.41	.82	.00	.00	.00	.00	293.68	.00	.00	.00
40	SAGBEND	-51.17	-2.86	1.22	.00	.00	.00	.00	293.66	.00	.00	.00
41	SAGBEND	-54.42	-3.31	1.61	.00	.00	.00	.00	293.64	.00	.00	.00
42	SAGBEND	-57.66	-3.76	2.00	.00	.00	.00	.00	293.61	.00	.00	.00
43	SAGBEND	-60.91	-4.21	2.39	.00	.00	.00	.00	293.59	.00	.00	.00
44	SAGBEND	-64.16	-4.65	2.77	.00	.00	.00	.00	293.57	.00	.00	.00
45	SAGBEND	-67.41	-5.09	3.14	.00	.00	.00	.00	293.54	.00	.00	.00
46	SAGBEND	-70.66	-5.53	3.50	.00	.00	.00	.00	293.52	.00	.00	.00
47	SAGBEND	-73.91	-5.97	3.87	.00	.00	.00	.00	293.49	.00	.00	.00
48	SAGBEND	-77.16	-6.41	4.22	.00	.00	.00	.00	293.47	.00	.00	.00
49	SAGBEND	-80.41	-6.84	4.57	.00	.00	.00	.00	293.45	.00	.00	.00
50	SAGBEND	-83.66	-7.27	4.92	.00	.00	.00	.00	293.43	.00	.00	.00
51	SAGBEND	-86.92	-7.70	5.26	.00	.00	.00	.00	293.40	.00	.01	.00
52	SAGBEND	-90.17	-8.13	5.60	.00	.00	.00	.00	293.38	.02	.04	.00
53	SAGBEND	-93.43	-8.56	5.93	.00	.00	.00	.00	293.36	.10	.21	.00
54	SAGBEND	-96.68	-8.98	6.26	.00	.00	.00	.00	293.31	.58	1.23	.00
55	SAGBEND	-99.94	-9.40	6.56	.00	.00	.00	.00	292.60	3.41	7.18	7.95
56	SAGBEND	-103.23	-9.72	6.68	.00	.00	.00	.00	292.36	29.26	61.04	67.69
57	SAGBEND	-106.51	-10.04	6.78	.00	.00	.00	.00	292.09	49.89	102.74	114.21
58	SAGBEND	-109.79	-10.35	6.86	.00	.00	.00	.00	291.82	66.33	134.65	150.10
59	SAGBEND	-113.08	-10.65	6.93	.00	.00	.00	.00	291.57	79.40	158.69	177.45
60	SAGBEND	-116.37	-10.93	6.96	.00	.00	.00	.00	291.33	89.72	176.33	197.84
61	SAGBEND	-119.66	-11.20	6.96	.00	.00	.00	.00	291.11	97.79	188.72	212.55
62	SAGBEND	-122.95	-11.46	6.94	.00	.00	.00	.00	290.92	103.99	196.72	222.51
63	SAGBEND	-126.24	-11.69	6.87	.00	.00	.00	.00	290.75	108.59	200.97	228.43

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD	Y COORD	Z COORD	SUPPORT REACTION VERT	HORIZ	SUPT SEPARATIONS VERT	HORIZ	PIPE TENSION	BENDING MOMENTS VERT	HORIZ	TOTAL

		(M)	(M)	(M)	(KN)	(KN)	(M)	(M)	(KN)	(KN-M)	(KN-M)	(KN-M)
64	SAGBEND	-129.53	-11.91	6.78	.00	.00	.00	.00	290.61	111.82	201.89	230.78
65	SAGBEND	-132.82	-12.11	6.65	.00	.00	.00	.00	290.49	113.81	199.72	229.87
66	SAGBEND	-136.11	-12.28	6.48	.00	.00	.00	.00	290.39	114.65	194.53	225.80
67	SAGBEND	-139.40	-12.44	6.28	.00	.00	.00	.00	290.32	114.37	186.24	218.55
68	SAGBEND	-142.69	-12.58	6.05	.00	.00	.00	.00	290.27	112.96	174.56	207.92
69	SAGBEND	-145.98	-12.70	5.79	.00	.00	.00	.00	290.24	110.35	159.05	193.58
70	SAGBEND	-149.26	-12.80	5.50	.00	.00	.00	.00	290.23	106.39	139.04	175.08
71	SAGBEND	-152.55	-12.88	5.18	.00	.00	.00	.00	290.24	100.91	113.63	151.97
72	SAGBEND	-155.83	-12.94	4.85	.00	.00	.00	.00	290.26	93.64	81.61	124.21
73	SAGBEND	-159.11	-12.99	4.50	.00	.00	.00	.00	290.28	84.22	47.57	96.72
74	SAGBEND	-162.39	-13.03	4.15	.00	.00	.00	.00	290.29	72.20	15.92	73.93
75	SAGBEND	-165.67	-13.05	3.79	.22	-.22	.00	.00	290.29	56.98	-14.93	58.90
76	SEABED	-168.95	-13.06	3.44	1.97	-1.98	.00	.00	290.28	38.67	-45.63	59.81
77	SEABED	-172.23	-13.06	3.09	3.14	-3.14	.00	.00	290.27	21.94	-72.17	75.43
78	SEABED	-175.52	-13.06	2.76	3.36	-3.36	.00	.00	290.25	9.84	-91.98	92.51
79	SEABED	-178.80	-13.06	2.44	3.15	-3.15	.00	.00	290.22	2.53	-105.31	105.34
80	SEABED	-182.09	-13.06	2.13	2.80	-2.80	.00	.00	290.21	-1.08	-113.51	113.52
81	SEABED	-185.38	-13.06	1.85	2.48	-2.48	.00	.00	290.20	-2.30	-118.16	118.18
82	SEABED	-188.67	-13.06	1.59	2.25	-2.25	.00	.00	290.20	-2.25	-120.53	120.56
83	SEABED	-191.96	-13.06	1.35	2.11	-2.11	.00	.00	290.19	-1.70	-121.51	121.53
84	SEABED	-195.25	-13.06	1.13	2.04	-2.04	.00	.00	290.19	-1.06	-121.61	121.61
85	SEABED	-198.54	-13.06	.93	2.02	-2.02	.00	.00	290.20	-.55	-121.05	121.05
86	SEABED	-201.84	-13.06	.75	2.02	-2.02	.00	.00	290.20	-.21	-119.90	119.90
87	SEABED	-205.14	-13.06	.60	2.03	-2.03	.00	.00	290.20	-.02	-118.08	118.08
88	SEABED	-208.43	-13.06	.46	2.04	-2.04	.00	.00	290.21	.06	-115.47	115.47
89	SEABED	-211.73	-13.06	.34	2.05	-2.05	.00	.00	290.21	.08	-111.91	111.91
90	SEABED	-215.03	-13.06	.25	2.06	-2.06	.00	.00	290.22	.07	-107.18	107.18
91	SEABED	-218.33	-13.06	.17	2.06	-2.06	.00	.00	290.23	.05	-101.02	101.02
92	SEABED	-221.63	-13.06	.11	2.06	-2.06	.00	.00	290.24	.03	-93.11	93.11
93	SEABED	-224.93	-13.06	.06	2.06	-2.06	.00	.00	290.26	.01	-83.05	83.05
94	SEABED	-228.23	-13.06	.03	2.06	-2.06	.00	.00	290.27	.00	-70.33	70.33
95	SEABED	-231.53	-13.06	.01	2.06	-1.62	.00	.00	290.29	.00	-54.31	54.31
96	SEABED	-234.83	-13.06	.00	2.06	.26	.00	.00	290.30	.00	-35.80	35.80
97	SEABED	-238.13	-13.06	-.01	2.06	1.25	.00	.00	290.31	.00	-19.85	19.85
98	SEABED	-241.43	-13.06	-.01	2.06	1.35	.00	.00	290.31	.00	-9.00	9.00
99	SEABED	-244.73	-13.06	.00	2.06	1.02	.00	.00	290.31	.00	-3.06	3.06
100	SEABED	-248.03	-13.06	.00	2.06	.53	.00	.00	290.31	.00	-.64	.64
101	SEABED	-251.33	-13.06	.00	.00	.08	.00	.00	290.31	.00	.00	.00

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*                                                                                         *
*                        VERSION NO. - 2.05 AC                                            *
*                        RELEASED ON - 10/24/1993                                         *
*                        LICENSED TO - RICKY TAWEKAL                                      *
*                                                                                         *
*******************************************************************************************
*                                                                                         *
*    OFFPIPE IS A NONLINEAR,  3-DIMENSIONAL FINITE ELEMENT METHOD BASED PROGRAM FOR THE   *
*    STATIC AND DYNAMIC ANALYSIS OF PROBLEMS ARISING IN THE DESIGN OF MARINE PIPELINES.   *
*    THIS VERSION  OF OFFPIPE MAY BE USED FOR THE ANALYSIS OF OFFSHORE PIPELAYING OPER-   *
*    ATIONS AND DAVIT LIFTS.                                                              *
*                                                                                         *
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*                                                                                         *
*                ROBERT C. MALAHY, JR.          TELEPHONE: (713) 664-8635                *
*                8007 MULLINS                   FACSIMILE: (713) 664-0962                *
*                HOUSTON, TEXAS 77081                                                    *
*                U.S.A.                                                                   *
*                                                                                         *
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Abandonment and Recovery
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USER ID - M. S. Pasengo      DATE -  7/27/2015   TIME -  5:33:38   CASE   1
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                    I N P U T   D A T A   E C H O


PROFILE PLOT TABLE ENTRIES
==========================
   PLOT TABLE INDEX ..................         2
   PLOT NUMBER .......................         2
   PLOT TYPE OPTION NUMBER ...........         1
   DYNAMIC PROFILE TIME POINT ........      .000
   DYNAMIC PROFILE TIME INCREMENT ....      .000
   ORDINATE PARAMETER CODE NUMBER ....        14
   AXIS LABEL FOR ORDINATE ........... "                              "
   ABSCISSA PARAMETER CODE NUMBER ....         1
   AXIS LABEL FOR ABSCISSA ........... "                              "

   PLOT TITLE ........................ "                                                  "
   MINIMUM HORIZONTAL AXIS RANGE .....      .000
   MAXIMUM HORIZONTAL AXIS RANGE .....      .000
   MINIMUM VERTICAL AXIS RANGE .......      .000
   MAXIMUM VERTICAL AXIS RANGE .......      .000

PROFILE PLOT TABLE ENTRIES
==========================
   PLOT TABLE INDEX ..................         1
   PLOT NUMBER .......................         1
   PLOT TYPE OPTION NUMBER ...........         1
   DYNAMIC PROFILE TIME POINT ........      .000
   DYNAMIC PROFILE TIME INCREMENT ....      .000
   ORDINATE PARAMETER CODE NUMBER ....         2
   AXIS LABEL FOR ORDINATE ........... "                              "
   ABSCISSA PARAMETER CODE NUMBER ....         1
   AXIS LABEL FOR ABSCISSA ........... "                              "

   PLOT TITLE ........................ "                                                  "
   MINIMUM HORIZONTAL AXIS RANGE .....      .000
   MAXIMUM HORIZONTAL AXIS RANGE .....      .000
   MINIMUM VERTICAL AXIS RANGE .......      .000
   MAXIMUM VERTICAL AXIS RANGE .......      .000


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                    I N P U T   D A T A   E C H O


PROFILE PLOT TABLE ENTRIES
==========================
```

```
   PLOT TABLE INDEX .................          3
   PLOT NUMBER ......................          1
   PLOT TYPE OPTION NUMBER ..........          1
   DYNAMIC PROFILE TIME POINT .......       .000
   DYNAMIC PROFILE TIME INCREMENT ...       .000
   ORDINATE PARAMETER CODE NUMBER ...          3
   AXIS LABEL FOR ORDINATE .......... "                              "
   ABSCISSA PARAMETER CODE NUMBER ...          1
   AXIS LABEL FOR ABSCISSA .......... "                              "

   PLOT TITLE ....................... "                                                  "
   MINIMUM HORIZONTAL AXIS RANGE ....       .000
   MAXIMUM HORIZONTAL AXIS RANGE ....       .000
   MINIMUM VERTICAL AXIS RANGE ......       .000
   MAXIMUM VERTICAL AXIS RANGE ......       .000

PLOTTER CONFIGURATION
=====================
   PLOTTER TYPE OPTION NUMBER .......          3
   DATA RANGE OPTION NUMBER .........          2
   PLOT PAGE WIDTH ( IN ) ...........       .000
   PLOT PAGE HEIGHT ( IN ) ..........       .000

PRINTED OUTPUT SELECTED
=======================
   PRINT PIPE STRAINS IN OUTPUT .....NO
   USE DNV STRESS FORMULA ...........NO
   STATIC PIPE FORCES AND STRESSES ...YES
   STATIC SOLUTION SUMMARY ..........NO
   OVERBEND PIPE SUPPORT GEOMETRY ....NO
   STINGER BALLAST SCHEDULE DATA .....NO
   DYNAMIC PIPE FORCES AND STRESSES ..YES
   DYNAMIC RANGE OF PIPE DATA ........NO
   DYNAMIC TRACKING OF PIPE DATA .....NO
   PLOT DATA FILE SUMMARY TABLES .....NO


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OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE   5
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PIPE PROPERTIES
===============
   PIPE PROPERTY TABLE ROW ...........          2
   PIPE SECTION LENGTH ..............    12.100 M
   STEEL MODULUS OF ELASTICITY ......   207000. MPA
   AREA OF STEEL CROSS SECTION ......      .000 CM**2
   COATED PIPE AVG MOMENT OF INERTIA .       .00 CM**4
   WEIGHT PER-UNIT-LENGTH IN AIR .....       .00 N/M
   WEIGHT PER-UNIT-LENGTH SUBMERGED ..       .00 N/M
   MAXIMUM ALLOWABLE PIPE STRAIN .....  .000000 PCT

   STEEL OUTSIDE DIAMETER ............   40.6400 CM
   STEEL WALL THICKNESS ..............    1.2700 CM
   YIELD STRESS ......................    359.00 MPA
   STRESS/STRAIN INTENSE FACTOR ......     .0000
   HYDRODYNAMIC OUTSIDE DIAMETER .....      .000 CM
   DRAG COEFFICIENT ..................     .0000
   HYDRODYNAMIC TOTAL AREA ...........      .000 CM**2
   ADDED MASS COEFFICIENT ............     .0000
   POISSON'S RATIO ...................     .3000
   COEFFICIENT OF THERMAL EXPANSION .. .00000000 1/DEG C

CABLE PROPERTIES
================
   PIPE PROPERTY TABLE INDEX .........          1
   CABLE SECTION LENGTH ..............      .000 M
   AXIAL STIFFNESS (EA) ..............       .00 KN
   BENDING STIFFNESS (EI) ............    .0000 KN-M**2
   WEIGHT PER-UNIT-LENGTH IN AIR .....       .0 N/M
   WEIGHT PER-UNIT-LENGTH SUBMERGED ..       .0 N/M

   CABLE DIAMETER ....................     3.800 CM
   DRAG COEFFICIENT ..................      .000
   CABLE CROSS SECTIONAL AREA ........      .000 KN
   ADDED MASS COEFFICIENT ............      .000


================================================================================
OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE   6
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PIPE COATING PROPERTIES
=======================
   PIPE PROPERTY TABLE INDEX .........          2
   CORROSION COATING THICKNESS .......       .550 CM
   CONCRETE COATING THICKNESS ........      2.540 CM
   STEEL WEIGHT DENSITY ..............    77009. N/M**3
   CORROSION COATING WEIGHT DENSITY ..    12750. N/M**3
   CONCRETE COATING WEIGHT DENSITY ...    29860. N/M**3
   DESIRED PIPE SPECIFIC GRAVITY .....     .0000

   AVERAGE PIPE JOINT LENGTH .........    12.100 M
   FIELD JOINT LENGTH ................      .000 M
   JOINT FILL WEIGHT DENSITY .........    10052. N/M**3
   DENSITY OF PIPE CONTENTS ..........       0. N/M**3

PIPE TENSION
============
   STATIC PIPE TENSION ON LAYBARGE ...   294.200 KN
   MINIMUM DYNAMIC PIPE TENSION ......      .000 KN
   MAXIMUM DYNAMIC PIPE TENSION ......      .000 KN

LAYBARGE DESCRIPTION
====================
   NUMBER OF PIPE NODES ..............         11
```

```
   BARGE GEOMETRY SPECIFIED BY .......         1 X-Y COORDINATES
   OVERBEND PIPE SUPPORT RADIUS ......   300.000 M
   TANGENT POINT X-COORDINATE ........      .000 M
   TANGENT POINT Y-COORDINATE ........      .000 M
   PIPE ANGLE RELATIVE TO DECK .......    .0000 DEG
   HEIGHT OF DECK ABOVE WATER ........     3.600 M
   LAYBARGE FORWARD (X) OFFSET .......      .000 M
   BARGE TRIM ANGLE ..................    .0000 DEG

   STERN SHOE X COORDINATE ..........      .000 M
   STERN SHOE Y COORDINATE ...........      .000 M
   ROTATION CENTER X COORDINATE ......    13.750 M
   ROTATION CENTER Y COORDINATE ......    -3.600 M
   ROTATION CENTER Z COORDINATE ......      .000 M
   BARGE HEADING .....................    .0000 DEG
   BARGE OFFSET FROM RIGHT-OF-WAY ....      .000 M
   PIPE RAMP PIVOT X COORDINATE ......      .000 M
   PIPE RAMP PIVOT Y COORDINATE ......      .000 M
   PIPE RAMP PIVOT ROTATION ANGLE ....      .000 DEG


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OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE   7
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    NODE X      NODE Y          SUPPORT          DAVIT
     COORD       COORD            TYPE          SPACING
     (M   )      (M   )                          (M   )
    =======    =======   ====================   =======
      78.480      2.608     1  SIMPLE SUPPORT        .000
      72.120      2.498     1  SIMPLE SUPPORT        .000
      65.950      2.390     1  SIMPLE SUPPORT        .000
      60.430      2.293     1  SIMPLE SUPPORT        .000
      53.790      2.177     1  SIMPLE SUPPORT        .000
      47.730      2.071     1  SIMPLE SUPPORT        .000
      38.540      1.951     2  PIPE TENSIONER        .000
      29.530      1.754     1  SIMPLE SUPPORT        .000
      23.330      1.646     1  SIMPLE SUPPORT        .000
      17.330      1.507     1  SIMPLE SUPPORT        .000
      10.720      1.220     1  SIMPLE SUPPORT        .000

STINGER DESCRIPTION
===================
   NUMBER OF PIPE/STINGER NODES ......         7
   STINGER GEOMETRY SPECIFIED BY .....         1 X-Y COORD AND TANGENT PT
   STINGER TYPE ......................         1 FIXED GEOMETRY OR RAMP
   OVERBEND PIPE SUPPORT RADIUS ......       .00 M
   HITCH X-COORDINATE ................      .000 M
   HITCH Y-COORDINATE ................     3.600 M

   X COORDINATE OF LOCAL ORIGIN ......      .000 M
   Y COORDINATE OF LOCAL ORIGIN ......      .000 M
   ROTATION ABOUT STINGER HITCH ......      .000 DEG
   TANGENT POINT X-COORDINATE ........      .000 M
   TANGENT POINT Y-COORDINATE ........      .000 M
   TANGENT POINT ANGLE ...............      .000 DEG

    NODE X      NODE Y          SUPPORT                ELEMENT          ELEMENT
     COORD       COORD            TYPE                   TYPE           LENGTH
     (M   )      (M   )                                                  (M   )
    =======    =======   ====================   ====================   =======
       -.890       .360     1  SIMPLE SUPPORT       2  HINGED END           .000
      -8.310      -.440     1  SIMPLE SUPPORT       1  FIXED END            .000
     -14.420     -1.220     1  SIMPLE SUPPORT       1  FIXED END            .000
     -24.800     -2.860     1  SIMPLE SUPPORT       1  FIXED END            .000
     -30.750     -3.950     1  SIMPLE SUPPORT       1  FIXED END            .000
     -36.660     -5.190     1  SIMPLE SUPPORT       1  FIXED END            .000
     -41.250     -6.210     1  SIMPLE SUPPORT       2  HINGED END           .000


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CURRENT VELOCITIES
==================
    WATER       CURRENT      DIRECTION
    DEPTH        SPEED       OF TRAVEL
   (M   )       (M/S )        (DEG )
   ======      =======      =========
     .000        3.500         90.000
    9.675        2.700         90.000
   19.350        1.900         90.000

SAGBEND GEOMETRY
================
   SAGBEND PIPE ELEMENT LENGTH .......    15.000 M
   WATER DEPTH .......................     6.75 M
   ESTIMATED SAGBEND X LENGTH ........      .00 M
   ESTIMATED PIPE LENGTH ON SEABED ...   100.00 M
   X-COORD OF PIPE FREE END ON SEABED       .00 M
   ESTIMATED SPAN DEPTH FOR BOW LINE .      .00 M
   PIPE VERTICAL ANGLE AT SEABED .....      .000 DEG
   X-COORDINATE OF SPECIFIED DEPTH ...      .00 M
   MAXIMUM SLOPE (ANGLE) OF SEABED ...      .000 DEG
   DIRECTION OF MAXIMUM SLOPE ........      .000 DEG

SAGBEND PIPE ELEMENT LENGTHS
============================
  NUMBER OF     ELEMENT
   ELEMENTS      LENGTH
                 (M   )
  ----------    -------
      100         15.000

WAVE SPECTRUM COEFFICIENTS
```

```
==========================
   NUMBER OF WAVES IN SPECTRUM .......        20
   1ST SPECTRUM COEFFICIENT ..........    1.0506 M2/S4
   2ND SPECTRUM COEFFICIENT ..........     .3249 1/S**4
   MINIMUM FREQUENCY IN SPECTRUM .....     .1000 RAD/S
   MAXIMUM FREQUENCY IN SPECTRUM .....    2.5000 RAD/S
   DIRECTION OF WAVE TRAVEL ..........    90.000 DEG

TIME INTEGRATION PARAMETERS
=======================
   TIME STEP LENGTH ..................     .4000 SEC
   SOLUTION STARTS AT TIME ...........    60.000 SEC
   MAXIMUM TIME OF INTEGRATION ....... 10860.000 SEC
   SOLUTION SAMPLING TIME STEP........     .800 SEC
   DAMPING RATIO .....................    .0000


================================================================================
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BARGE MOTION RAO TABLE ( OFFPIPE  ) SIGN CONVENTION
===================================================
     WAVE    /------ SURGE -----/  /------ SWAY -----/  /------ HEAVE -----/
  FREQUENCY   AMPLITUDE    PHASE    AMPLITUDE    PHASE    AMPLITUDE    PHASE
  (RAD/S  )    (M/M  )     (DEG)     (M/M  )     (DEG)     (M/M  )     (DEG)
  =========    =======   =======    =======    =======    =======   =======
     .1000      .0000        .00      .0000        .00     1.0000        .00
     .2260      .0000        .00      .0000        .00     1.0000        .00
     .3530      .0000        .00      .0000        .00      .9990       -.10
     .4790      .0000        .00      .0000        .00      .9940       -.50
     .6050      .0000        .00      .0000        .00      .9780      -1.50
     .7320      .0000        .00      .0000        .00      .9360      -3.20
     .8580      .0000        .00      .0000        .00      .8570      -5.90
     .9840      .0000        .00      .0000        .00      .7200      -9.10
    1.1110      .0000        .00      .0000        .00      .5360      -9.30
    1.2370      .0000        .00      .0000        .00      .3660      -3.10
    1.3630      .0000        .00      .0000        .00      .2390      11.30
    1.4890      .0000        .00      .0000        .00      .1620      33.70
    1.6160      .0000        .00      .0000        .00      .1200      58.90
    1.7420      .0000        .00      .0000        .00      .0870      81.40
    1.8680      .0000        .00      .0000        .00      .0570     108.70
    1.9950      .0000        .00      .0000        .00      .0350     145.00
    2.1210      .0000        .00      .0000        .00      .0290    -162.40
    2.2470      .0000        .00      .0000        .00      .0410    -136.50
    2.3740      .0000        .00      .0000        .00      .0600      14.90
    2.5000      .0000        .00      .0000        .00      .0190      35.10

     WAVE    /------ ROLL ------/  /------ PITCH -----/  /------- YAW ------/
  FREQUENCY   AMPLITUDE    PHASE    AMPLITUDE    PHASE    AMPLITUDE    PHASE
  (RAD/S  )   (DEG/M )     (DEG)    (DEG/M )     (DEG)    (DEG/M )     (DEG)
  =========   ========    =======   ========    =======   ========    =======
     .1000     1.0260      90.00      .0000     -16.00      .0000        .00
     .2260     1.0360      90.00      .0000     -44.20      .0000        .00
     .3530     1.0530      90.00      .0000     -60.20      .0000        .00
     .4790     1.0840      90.20      .0000     -56.50      .0000        .00
     .6050     1.1380      91.10      .0010     -45.40      .0000        .00
     .7320     1.2290      93.70      .0010     -59.10      .0000        .00
     .8580     1.3800     101.30      .0020     -97.90      .0000        .00
     .9840     1.4970     122.50      .0030    -148.20      .0000        .00
    1.1110     1.0410     153.70      .0020     156.80      .0000        .00
    1.2370      .5230     164.20      .0010      97.60      .0000        .00
    1.3630      .2660     159.60      .0010      44.70      .0000        .00
    1.4890      .1380     146.20      .0010      48.30      .0000        .00
    1.6160      .0710     125.40      .0010      33.00      .0000        .00
    1.7420      .0390      90.40      .0010      10.80      .0000        .00
    1.8680      .0270      54.60      .0010     -12.40      .0000        .00
    1.9950      .0210      28.50      .0010     -26.80      .0000        .00
    2.1210      .0130      11.20      .0000     -52.60      .0000        .00
    2.2470      .0050      -8.60      .0000    -177.60      .0000        .00


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    2.3740      .0080    -116.60      .0060      13.30      .0000        .00
    2.5000      .0020      86.50      .0010     -18.00      .0000        .00


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OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE  11
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                        I N P U T   D A T A   E C H O


CABLE PROPERTIES
================
   PIPE PROPERTY TABLE INDEX .........        1
   CABLE SECTION LENGTH ..............   120.000 M
   AXIAL STIFFNESS (EA) ..............      .00 KN
   BENDING STIFFNESS (EI) ............    .0000 KN-M**2
   WEIGHT PER-UNIT-LENGTH IN AIR .....      .0 N/M
   WEIGHT PER-UNIT-LENGTH SUBMERGED ..      .0 N/M

   CABLE DIAMETER ....................    3.800 CM
   DRAG COEFFICIENT ..................     .000
   CABLE CROSS SECTIONAL AREA ........     .000 KN
   ADDED MASS COEFFICIENT ............     .000

SAGBEND GEOMETRY
================
   SAGBEND PIPE ELEMENT LENGTH .......   15.000 M
```

```
   WATER DEPTH .....                6.75 M
   ESTIMATED SAGBEND X LENGTH .....    172.00 M
   ESTIMATED PIPE LENGTH ON SEABED ...    100.00 M
   X-COORD OF PIPE FREE END ON SEABED       .00 M
   ESTIMATED SPAN DEPTH FOR BOW LINE .      .00 M
   PIPE VERTICAL ANGLE AT SEABED .....      .000 DEG
   X-COORDINATE OF SPECIFIED DEPTH ...      .00 M
   MAXIMUM SLOPE (ANGLE) OF SEABED ...      .000 DEG
   DIRECTION OF MAXIMUM SLOPE .....         .000 DEG

SAGBEND PIPE ELEMENT LENGTHS
============================
  NUMBER OF     ELEMENT
   ELEMENTS      LENGTH
                 (M   )
  ---------     -------
     100          3.500
     100         30.000
     100         50.000


================================================================================
OFFPIPE - OFFSHORE PIPELINE ANALYSIS SYSTEM - VERSION 2.05 AC          PAGE  12
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CABLE PROPERTIES
================
   PIPE PROPERTY TABLE INDEX .....          1
   CABLE SECTION LENGTH .....     150.000 M
   AXIAL STIFFNESS (EA) .....         .00 KN
   BENDING STIFFNESS (EI) .....      .0000 KN-M**2
   WEIGHT PER-UNIT-LENGTH IN AIR .....         .0 N/M
   WEIGHT PER-UNIT-LENGTH SUBMERGED ..         .0 N/M

   CABLE DIAMETER .....                3.800 CM
   DRAG COEFFICIENT .....               .000
   CABLE CROSS SECTIONAL AREA .....     .000 KN
   ADDED MASS COEFFICIENT .....         .000

SAGBEND GEOMETRY
================
   SAGBEND PIPE ELEMENT LENGTH .....    15.000 M
   WATER DEPTH .....                6.75 M
   ESTIMATED SAGBEND X LENGTH .....    100.00 M
   ESTIMATED PIPE LENGTH ON SEABED ...    100.00 M
   X-COORD OF PIPE FREE END ON SEABED       .00 M
   ESTIMATED SPAN DEPTH FOR BOW LINE .      .00 M
   PIPE VERTICAL ANGLE AT SEABED .....      .000 DEG
   X-COORDINATE OF SPECIFIED DEPTH ...      .00 M
   MAXIMUM SLOPE (ANGLE) OF SEABED ...      .000 DEG
   DIRECTION OF MAXIMUM SLOPE .....         .000 DEG

SAGBEND PIPE ELEMENT LENGTHS
============================
  NUMBER OF     ELEMENT
   ELEMENTS      LENGTH
                 (M   )
  ---------     -------
     100          3.000
     100         30.000
     100         50.000


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CABLE PROPERTIES
================
   PIPE PROPERTY TABLE INDEX .....          1
   CABLE SECTION LENGTH .....     180.000 M
   AXIAL STIFFNESS (EA) .....         .00 KN
   BENDING STIFFNESS (EI) .....      .0000 KN-M**2
   WEIGHT PER-UNIT-LENGTH IN AIR .....         .0 N/M
   WEIGHT PER-UNIT-LENGTH SUBMERGED ..         .0 N/M

   CABLE DIAMETER .....                3.800 CM
   DRAG COEFFICIENT .....               .000
   CABLE CROSS SECTIONAL AREA .....     .000 KN
   ADDED MASS COEFFICIENT .....         .000

SAGBEND GEOMETRY
================
   SAGBEND PIPE ELEMENT LENGTH .....    15.000 M
   WATER DEPTH .....                6.75 M
   ESTIMATED SAGBEND X LENGTH .....    172.00 M
   ESTIMATED PIPE LENGTH ON SEABED ...    100.00 M
   X-COORD OF PIPE FREE END ON SEABED       .00 M
   ESTIMATED SPAN DEPTH FOR BOW LINE .      .00 M
   PIPE VERTICAL ANGLE AT SEABED .....      .000 DEG
   X-COORDINATE OF SPECIFIED DEPTH ...      .00 M
   MAXIMUM SLOPE (ANGLE) OF SEABED ...      .000 DEG
   DIRECTION OF MAXIMUM SLOPE .....         .000 DEG

SAGBEND PIPE ELEMENT LENGTHS
============================
  NUMBER OF     ELEMENT
   ELEMENTS      LENGTH
                 (M   )
  ---------     -------
     100          3.500
     100         30.000
     100         50.000

END OF INPUT DATA
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STATIC SOLUTION CONVERGED IN (26) ITERATIONS

STATIC SOLUTION CONVERGED IN (39) ITERATIONS

STATIC SOLUTION CONVERGED IN (91) ITERATIONS

STATIC SOLUTION CONVERGED IN (68) ITERATIONS

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	BENDING STRESSES HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
1	LAYBARGE	78.48	6.21	.00	.000	1.001	.000	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.000	.994	6.361	-.02	.00	-8.80	.00	8.81	2.46
5	LAYBARGE	65.95	5.99	.00	.000	1.005	12.532	-.03	.00	-3.88	.00	3.91	1.09
7	LAYBARGE	60.43	5.89	.00	.000	1.011	18.053	-.05	.00	-5.71	.00	5.76	1.60
9	LAYBARGE	53.79	5.78	.00	.000	.981	24.694	-.06	.00	.79	.00	.86	.24
11	LAYBARGE	47.73	5.68	.00	.000	.845	30.755	-.08	.00	22.42	.00	22.50	6.27
13	TENSIONR	38.54	5.55	.00	.000	.910	39.945	18.63	.00	-54.89	-.01	73.52	20.48
15	LAYBARGE	29.53	5.38	.00	.000	1.105	48.958	18.61	.00	.89	.00	19.50	5.43
17	LAYBARGE	23.33	5.26	.00	.000	1.210	55.159	18.59	.00	-36.23	.00	54.81	15.27
19	LAYBARGE	17.33	5.11	.00	.000	1.869	61.160	18.55	.00	-136.59	-.01	155.13	43.21
21	LAYBARGE	10.72	4.82	.00	.000	3.142	67.777	18.49	.00	-162.06	.02	180.55	50.29
24	STINGER	-.89	3.96	.00	-.001	5.339	79.420	18.36	.00	-164.79	-.10	183.15	51.02
26	STINGER	-8.31	3.17	.00	.002	6.752	86.883	18.26	.00	-133.65	.52	151.90	42.31
28	STINGER	-14.42	2.38	.00	-.006	8.092	93.043	18.11	.00	-200.21	-2.24	218.34	60.82
30	STINGER	-24.80	.75	.00	.028	9.229	103.552	17.91	.00	6.18	7.06	27.29	7.60
32	STINGER	-30.78	-.21	.00	-.095	8.980	109.601	17.77	-.03	47.21	-38.95	79.00	22.00
34	STINGER	-36.73	-1.12	.00	.347	8.519	115.622	17.64	-.18	64.12	137.72	169.64	47.25
36	STINGER	-41.36	-1.80	.00	-1.136	8.078	120.306	17.16	-.29	80.24	-606.02	628.61	175.10
38	SAGBEND	-56.22	-3.70	1.29	-6.876	6.363	135.349	17.34	-.59	87.04	-46.03	116.09	32.34
39	SAGBEND	-71.06	-5.13	2.98	-5.498	4.571	150.352	17.14	-.82	88.21	144.49	186.84	52.05
40	SAGBEND	-85.99	-6.09	3.96	-1.869	2.797	165.353	17.00	-.98	84.71	194.62	229.75	64.00
41	SAGBEND	-100.98	-6.60	3.94	1.986	1.193	180.353	16.95	-1.06	69.72	170.67	201.85	56.22
42	SEABED	-115.95	-6.76	3.04	4.512	.134	195.353	16.97	-1.09	27.23	56.03	79.81	22.23
43	SEABED	-130.90	-6.76	1.83	4.343	-.022	210.353	16.97	-1.09	-1.33	-48.26	65.79	18.33
44	SEABED	-145.87	-6.76	.86	3.051	.000	225.353	16.96	-1.09	-.31	-71.69	89.20	24.85
45	SEABED	-160.86	-6.76	.25	1.561	.000	240.353	16.96	-1.09	.05	-70.26	87.77	24.45
46	SEABED	-175.86	-6.76	.02	.342	.000	255.353	16.97	-1.09	.00	-42.69	60.20	16.77
47	SEABED	-190.86	-6.76	.00	-.025	.000	270.353	16.97	-1.09	.00	-.89	18.43	5.13
48	SEABED	-205.86	-6.76	.00	-.003	.000	285.353	16.97	-1.09	.00	.74	18.28	5.09
49	SEABED	-220.86	-6.76	.00	.001	.000	300.353	16.97	-1.09	.00	-.06	17.59	4.90
50	SEABED	-235.86	-6.76	.00	.000	.000	315.353	16.97	-1.09	.00	-.01	17.54	4.89
51	SEABED	-250.86	-6.76	.00	.000	.000	330.353	16.97	-1.09	.00	.00	17.54	4.89
52	SEABED	-265.86	-6.76	.00	.000	.000	345.353	16.97	-1.09	.00	.00	17.54	4.89

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
1	LAYBARGE	78.48	6.21	.00	5.42	.00	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	18.03	.00	.00	.00	-.26	-13.19	.00	13.19
5	LAYBARGE	65.95	5.99	.00	12.08	.00	.00	.00	-.51	-5.82	.00	5.82
7	LAYBARGE	60.43	5.89	.00	16.29	.00	.00	.00	-.74	-8.56	.00	8.56
9	LAYBARGE	53.79	5.78	.00	18.84	.00	.00	.00	-1.02	1.19	.00	1.19
11	LAYBARGE	47.73	5.68	.00	.00	.00	.01	.00	-1.26	33.62	.00	33.62
13	TENSIONR	38.54	5.55	.00	44.11	.00	.00	.00	292.64	-82.30	-.01	82.30
15	LAYBARGE	29.53	5.38	.00	.00	.00	.03	.00	292.30	1.34	.00	1.34
17	LAYBARGE	23.33	5.26	.00	.00	.01	.01	.00	291.99	-54.31	.00	54.31
19	LAYBARGE	17.33	5.11	.00	39.31	.00	.00	.00	291.31	-204.79	-.01	204.79
21	LAYBARGE	10.72	4.82	.00	35.75	.02	.00	.00	290.50	-242.97	.03	242.97
24	STINGER	-.89	3.96	.00	38.27	-.14	.00	.00	288.46	-247.07	-.15	247.07
26	STINGER	-8.31	3.17	.00	.00	.80	.01	.00	286.77	-200.38	.78	200.38
28	STINGER	-14.42	2.38	.00	72.67	-2.00	.00	.00	284.51	-300.18	-3.35	300.20
30	STINGER	-24.80	.75	.00	.00	11.19	.01	.00	281.39	9.26	10.59	14.06
32	STINGER	-30.78	-.21	.00	-.02	-63.75	.15	.00	279.42	70.79	-58.40	91.77
34	STINGER	-36.73	-1.12	.00	-.35	270.36	.47	.00	278.50	96.13	206.48	227.76
36	STINGER	-41.36	-1.80	.00	-1.49	-338.16	.82	.00	271.84	120.30	-908.60	916.53
38	SAGBEND	-56.22	-3.70	1.29	.00	.00	.00	.00	277.12	130.49	-69.01	147.62
39	SAGBEND	-71.06	-5.13	2.98	.00	.00	.00	.00	275.89	132.25	216.64	253.82
40	SAGBEND	-85.99	-6.09	3.96	.00	.00	.00	.00	275.00	127.00	291.80	318.24
41	SAGBEND	-100.98	-6.60	3.94	.01	-.03	.00	.00	274.87	104.53	255.88	276.41
42	SEABED	-115.95	-6.76	3.04	8.05	-8.01	.00	.00	275.30	40.83	84.00	93.40
43	SEABED	-130.90	-6.76	1.83	12.27	-12.26	.00	.00	275.33	-2.00	-72.35	72.38
44	SEABED	-145.87	-6.76	.86	9.31	-9.31	.00	.00	275.27	-.47	-107.48	107.48
45	SEABED	-160.86	-6.76	.25	9.34	-9.34	.00	.00	275.28	.08	-105.34	105.34
46	SEABED	-175.86	-6.76	.02	9.38	-5.72	.00	.00	275.33	.00	-64.00	64.00
47	SEABED	-190.86	-6.76	.00	9.38	3.97	.00	.00	275.36	.00	-1.34	1.34
48	SEABED	-205.86	-6.76	.00	9.38	.23	.00	.00	275.35	.00	1.11	1.11
49	SEABED	-220.86	-6.76	.00	9.38	-.08	.00	.00	275.35	.00	-.09	.09
50	SEABED	-235.86	-6.76	.00	9.38	.00	.00	.00	275.35	.00	-.01	.01
51	SEABED	-250.86	-6.76	.00	9.38	.00	.00	.00	275.35	.00	.00	.00
52	SEABED	-265.86	-6.76	.00	.00	.00	.00	.00	275.35	.00	.00	.00

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
1	LAYBARGE	78.48	6.21	.00	.000	.991	.000	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.000	.997	6.361	.00	.00	.00	.00	.00	.00
5	LAYBARGE	65.95	5.99	.00	.000	1.005	12.532	.00	.00	.00	.00	.00	.00
7	LAYBARGE	60.43	5.89	.00	.000	1.004	18.053	.00	.00	.00	.00	.00	.00
9	LAYBARGE	53.79	5.78	.00	.000	1.001	24.694	.00	.00	.00	.00	.00	.00
11	LAYBARGE	47.73	5.67	.00	.000	.875	30.755	.00	.00	.00	.00	.00	.00
13	TENSIONR	38.54	5.55	.00	.000	.967	39.945	.00	.00	.00	.00	.00	.00
15	LAYBARGE	29.53	5.36	.00	.000	1.140	48.958	.00	.00	.00	.00	.00	.00
17	LAYBARGE	23.33	5.25	.00	.000	1.212	55.159	.00	.00	.00	.00	.00	.00
19	LAYBARGE	17.33	5.11	.00	.000	1.907	61.160	.00	.00	.00	.00	.00	.00
21	LAYBARGE	10.72	4.82	.00	.000	3.361	67.777	.00	.00	.00	.00	.00	.00
24	STINGER	-.89	3.96	.00	.000	5.195	79.419	.00	.00	.00	.00	.00	.00
26	STINGER	-8.31	3.16	.00	.000	6.714	86.882	.00	.00	.00	.00	.00	.00
28	STINGER	-14.42	2.38	.00	.000	8.127	93.042	.00	.00	.00	.00	.00	.00
30	STINGER	-24.80	.74	.00	.000	9.009	103.551	.00	.00	.00	.00	.00	.00
32	STINGER	-30.77	-.21	.00	.000	9.006	109.600	.00	.00	.00	.00	.00	.00
34	STINGER	-36.74	-1.15	.00	.067	8.946	115.639	.00	.00	.00	.00	.00	.00
36	STINGER	-41.36	-1.88	-.01	-10.830	6.653	120.326	18.19	-.30	.00	.00	18.34	5.11
38	SAGBEND	-44.80	-2.28	.64	-10.681	6.608	123.852	18.13	-.37	18.01	59.19	80.18	22.34
39	SAGBEND	-48.22	-2.68	1.28	-10.283	6.487	127.352	18.08	-.43	32.22	104.48	127.63	35.55
40	SAGBEND	-50.55	-2.95	1.69	-9.901	6.370	129.733	18.04	-.47	40.23	129.09	153.49	42.75
41	SAGBEND	-52.88	-3.21	2.09	-9.445	6.228	132.113	18.00	-.52	47.12	149.54	175.04	48.76
42	SAGBEND	-55.08	-3.45	2.45	-8.961	6.076	134.352	17.96	-.56	52.76	165.51	191.95	53.47
43	SAGBEND	-58.52	-3.81	2.96	-8.118	5.807	137.852	17.91	-.61	60.08	185.19	212.91	59.31
44	SAGBEND	-61.97	-4.16	3.43	-7.194	5.507	141.352	17.86	-.67	65.92	199.54	228.34	63.61
45	SAGBEND	-65.43	-4.49	3.84	-6.213	5.182	144.852	17.81	-.72	70.54	209.56	239.29	66.66
46	SAGBEND	-68.90	-4.79	4.18	-5.193	4.837	148.352	17.77	-.77	74.14	216.02	246.54	68.67
47	SAGBEND	-72.38	-5.08	4.47	-4.151	4.478	151.852	17.73	-.82	76.85	219.44	250.65	69.82
48	SAGBEND	-75.86	-5.34	4.69	-3.098	4.107	155.352	17.70	-.86	78.78	220.22	252.01	70.20
49	SAGBEND	-79.35	-5.58	4.84	-2.049	3.729	158.852	17.67	-.90	79.99	218.55	250.85	69.87
50	SAGBEND	-82.84	-5.79	4.94	-1.014	3.347	162.352	17.65	-.93	80.52	214.51	247.24	68.87
51	SAGBEND	-86.34	-5.99	4.97	-.004	2.963	165.852	17.63	-.96	80.36	208.03	241.12	67.16
52	SAGBEND	-89.83	-6.15	4.94	.969	2.582	169.352	17.61	-.99	79.50	198.89	232.30	64.71
53	SAGBEND	-93.33	-6.30	4.85	1.890	2.207	172.852	17.60	-1.01	77.86	186.72	220.42	61.40
54	SAGBEND	-96.82	-6.42	4.71	2.745	1.842	176.352	17.59	-1.03	75.36	170.97	204.96	57.09
55	SAGBEND	-100.32	-6.53	4.52	3.514	1.491	179.852	17.59	-1.05	71.86	150.88	185.23	51.60
56	SAGBEND	-103.81	-6.61	4.28	4.175	1.159	183.352	17.58	-1.06	67.17	125.42	160.40	44.68
57	SAGBEND	-107.30	-6.67	4.01	4.700	.853	186.852	17.59	-1.07	61.04	93.27	129.60	36.10
58	SAGBEND	-110.78	-6.71	3.71	5.062	.580	190.352	17.59	-1.08	53.16	59.49	97.91	27.27
59	SAGBEND	-114.27	-6.74	3.40	5.272	.349	193.852	17.59	-1.08	43.09	29.02	70.09	19.52
60	SEABED	-117.75	-6.76	3.07	5.342	.173	197.352	17.59	-1.09	30.42	.32	48.56	13.53
61	SEABED	-121.24	-6.76	2.75	5.281	.059	200.852	17.59	-1.09	17.65	-25.02	48.76	13.58
62	SEABED	-124.72	-6.76	2.43	5.113	.000	204.352	17.59	-1.09	8.07	-44.42	63.28	17.63

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
63	SEABED	-128.21	-6.76	2.13	4.866	-.024	207.852	17.58	-1.09	2.23	-57.87	76.05	21.18
64	SEABED	-131.70	-6.76	1.84	4.568	-.026	211.352	17.58	-1.09	-.62	-66.55	84.68	23.59
65	SEABED	-135.19	-6.76	1.57	4.237	-.021	214.852	17.58	-1.09	-1.57	-71.86	90.01	25.07
66	SEABED	-138.68	-6.76	1.32	3.886	-.013	218.352	17.58	-1.09	-1.53	-74.96	93.10	25.93
67	SEABED	-142.17	-6.76	1.09	3.525	-.007	221.852	17.58	-1.09	-1.11	-76.63	94.77	26.40
68	SEABED	-145.67	-6.76	.89	3.157	-.002	225.352	17.58	-1.09	-.66	-77.34	95.48	26.60
69	SEABED	-149.16	-6.76	.71	2.788	.000	228.852	17.58	-1.09	-.31	-77.29	95.42	26.58
70	SEABED	-152.66	-6.76	.55	2.421	.001	232.352	17.58	-1.09	-.09	-76.52	94.65	26.36
71	SEABED	-156.16	-6.76	.41	2.060	.001	235.852	17.58	-1.09	.01	-74.98	93.11	25.93
72	SEABED	-159.65	-6.76	.30	1.708	.001	239.352	17.58	-1.09	.05	-72.54	90.67	25.26
73	SEABED	-163.15	-6.76	.20	1.370	.000	242.852	17.58	-1.09	.05	-69.05	87.18	24.29
74	SEABED	-166.65	-6.76	.13	1.051	.000	246.352	17.58	-1.09	.04	-64.29	82.42	22.96
75	SEABED	-170.15	-6.76	.07	.759	.000	249.852	17.59	-1.09	.02	-57.98	76.11	21.20
76	SEABED	-173.65	-6.76	.04	.501	.000	253.352	17.59	-1.09	.01	-49.76	67.90	18.91
77	SEABED	-177.15	-6.76	.01	.288	.000	256.852	17.59	-1.09	.00	-39.17	57.31	15.96
78	SEABED	-180.65	-6.76	.00	.132	.000	260.352	17.59	-1.09	.00	-26.20	44.34	12.35
79	SEABED	-184.15	-6.76	.00	.037	.000	263.852	17.59	-1.09	.00	-14.25	32.39	9.02
80	SEABED	-187.65	-6.76	-.01	-.010	.000	267.352	17.59	-1.09	.00	-5.85	24.00	6.69
81	SEABED	-191.15	-6.76	.00	-.025	.000	270.852	17.59	-1.09	.00	-1.06	19.22	5.35
82	SEABED	-194.65	-6.76	.00	-.024	.000	274.352	17.59	-1.09	.00	1.06	19.22	5.35
83	SEABED	-198.15	-6.76	.00	-.018	.000	277.852	17.59	-1.09	.00	1.60	19.75	5.50
84	SEABED	-201.65	-6.76	.00	-.010	.000	281.352	17.59	-1.09	.00	1.38	19.53	5.44
85	SEABED	-205.15	-6.76	.00	-.005	.000	284.852	17.59	-1.09	.00	.93	19.08	5.32
86	SEABED	-208.65	-6.76	.00	-.001	.000	288.352	17.59	-1.09	.00	.51	18.66	5.20
87	SEABED	-212.15	-6.76	.00	.000	.000	291.852	17.59	-1.09	.00	.21	18.37	5.12
88	SEABED	-215.65	-6.76	.00	.001	.000	295.352	17.59	-1.09	.00	.04	18.20	5.07
89	SEABED	-219.15	-6.76	.00	.001	.000	298.852	17.59	-1.09	.00	-.04	18.19	5.07
90	SEABED	-222.65	-6.76	.00	.001	.000	302.352	17.59	-1.09	.00	-.06	18.21	5.07
91	SEABED	-226.15	-6.76	.00	.000	.000	305.852	17.59	-1.09	.00	-.05	18.21	5.07
92	SEABED	-229.65	-6.76	.00	.000	.000	309.352	17.59	-1.09	.00	-.03	18.19	5.07
93	SEABED	-233.15	-6.76	.00	.000	.000	312.852	17.59	-1.09	.00	-.02	18.17	5.06
94	SEABED	-236.65	-6.76	.00	.000	.000	316.352	17.59	-1.09	.00	-.01	18.16	5.06
95	SEABED	-240.15	-6.76	.00	.000	.000	319.852	17.59	-1.09	.00	.00	18.16	5.06
96	SEABED	-243.65	-6.76	.00	.000	.000	323.352	17.59	-1.09	.00	.00	18.16	5.06
97	SEABED	-247.15	-6.76	.00	.000	.000	326.852	17.59	-1.09	.00	.00	18.16	5.06
98	SEABED	-250.65	-6.76	.00	.000	.000	330.352	17.59	-1.09	.00	.00	18.16	5.06
99	SEABED	-254.15	-6.76	.00	.000	.000	333.852	17.59	-1.09	.00	.00	18.16	5.06
100	SEABED	-257.65	-6.76	.00	.000	.000	337.352	17.59	-1.09	.00	.00	18.16	5.06
101	SEABED	-261.15	-6.76	.00	.000	.000	340.852	17.59	-1.09	.00	.00	18.16	5.06
102	SEABED	-264.65	-6.76	.00	.000	.000	344.352	17.59	-1.09	.00	.00	18.16	5.06
103	SEABED	-268.15	-6.76	.00	.000	.000	347.852	17.59	-1.09	.00	.00	18.16	5.06
104	SEABED	-271.65	-6.76	.00	.000	.000	351.352	17.59	-1.09	.00	.00	18.16	5.06
105	SEABED	-275.15	-6.76	.00	.000	.000	354.852	17.59	-1.09	.00	.00	18.16	5.06
106	SEABED	-278.65	-6.76	.00	.000	.000	358.352	17.59	-1.09	.00	.00	18.16	5.06
107	SEABED	-282.15	-6.76	.00	.000	.000	361.852	17.59	-1.09	.00	.00	18.16	5.06
108	SEABED	-285.65	-6.76	.00	.000	.000	365.352	17.59	-1.09	.00	.00	18.16	5.06

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	BENDING STRESSES HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
109	SEABED	-289.15	-6.76	.00	.000	.000	368.852	17.59	-1.09	.00	.00	18.16	5.06
110	SEABED	-292.65	-6.76	.00	.000	.000	372.352	17.59	-1.09	.00	.00	18.16	5.06
111	SEABED	-296.15	-6.76	.00	.000	.000	375.852	17.59	-1.09	.00	.00	18.16	5.06
112	SEABED	-299.65	-6.76	.00	.000	.000	379.352	17.59	-1.09	.00	.00	18.16	5.06
113	SEABED	-303.15	-6.76	.00	.000	.000	382.852	17.59	-1.09	.00	.00	18.16	5.06
114	SEABED	-306.65	-6.76	.00	.000	.000	386.352	17.59	-1.09	.00	.00	18.16	5.06
115	SEABED	-310.15	-6.76	.00	.000	.000	389.852	17.59	-1.09	.00	.00	18.16	5.06
116	SEABED	-313.65	-6.76	.00	.000	.000	393.352	17.59	-1.09	.00	.00	18.16	5.06

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
1	LAYBARGE	78.48	6.21	.00	.19	.00	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.38	.00	.00	.00	-.01	.00	.00	.00
5	LAYBARGE	65.95	5.99	.00	.36	.00	.00	.00	-.01	.00	.00	.00
7	LAYBARGE	60.43	5.89	.00	.37	.00	.00	.00	-.02	.00	.00	.00
9	LAYBARGE	53.79	5.78	.00	.39	.00	.00	.00	-.03	.00	.00	.00
11	LAYBARGE	47.73	5.67	.00	.47	.00	.00	.00	-.03	.00	.00	.00
13	TENSIONR	38.54	5.55	.00	1.68	.00	.00	.00	294.14	.00	.00	.00
15	LAYBARGE	29.53	5.36	.00	.00	.00	.01	.00	294.14	.00	.00	.00
17	LAYBARGE	23.33	5.25	.00	1.57	.00	.00	.00	294.13	.00	.00	.00
19	LAYBARGE	17.33	5.11	.00	6.33	.00	.00	.00	294.10	.00	.00	.00
21	LAYBARGE	10.72	4.82	.00	9.54	.00	.00	.00	294.07	.00	.00	.00
24	STINGER	-.89	3.96	.00	10.42	.00	.00	.00	294.01	.00	.00	.00
26	STINGER	-8.31	3.16	.00	6.17	.00	.00	.00	293.99	.00	.00	.00
28	STINGER	-14.42	2.38	.00	9.24	.00	.00	.00	293.92	.00	.00	.00
30	STINGER	-24.80	.74	.00	.80	-.13	.00	.00	293.86	.00	.00	.00
32	STINGER	-30.77	-.21	.00	.00	-.69	.14	.00	293.80	.00	.00	.00
34	STINGER	-36.74	-1.15	.00	.00	-.30	.45	.00	293.75	.00	.00	.00
36	STINGER	-41.36	-1.88	-.01	-3.53	-84.13	.74	.00	288.15	.00	.00	.00
38	SAGBEND	-44.80	-2.28	.64	.00	.00	.00	.00	287.82	27.01	88.74	92.76
39	SAGBEND	-48.22	-2.68	1.28	.00	.00	.00	.00	287.43	48.31	156.65	163.93
40	SAGBEND	-50.55	-2.95	1.69	.00	.00	.00	.00	287.15	60.32	193.54	202.72
41	SAGBEND	-52.88	-3.21	2.09	.00	.00	.00	.00	286.87	70.64	224.21	235.07
42	SAGBEND	-55.08	-3.45	2.45	.00	.00	.00	.00	286.62	79.10	248.15	260.45
43	SAGBEND	-58.52	-3.81	2.96	.00	.00	.00	.00	286.26	90.08	277.66	291.91
44	SAGBEND	-61.97	-4.16	3.43	.00	.00	.00	.00	285.93	98.84	299.17	315.08
45	SAGBEND	-65.43	-4.49	3.84	.00	.00	.00	.00	285.65	105.77	314.20	331.52
46	SAGBEND	-68.90	-4.79	4.18	.00	.00	.00	.00	285.40	111.16	323.87	342.42
47	SAGBEND	-72.38	-5.08	4.47	.00	.00	.00	.00	285.18	115.23	329.01	348.60
48	SAGBEND	-75.86	-5.34	4.69	.00	.00	.00	.00	285.01	118.12	330.17	350.66
49	SAGBEND	-79.35	-5.58	4.84	.00	.00	.00	.00	284.87	119.93	327.67	348.93
50	SAGBEND	-82.84	-5.79	4.94	.00	.00	.00	.00	284.76	120.72	321.61	343.52
51	SAGBEND	-86.34	-5.99	4.97	.00	.00	.00	.00	284.69	120.49	311.90	334.36
52	SAGBEND	-89.83	-6.15	4.94	.00	.00	.00	.00	284.66	119.19	298.20	321.14
53	SAGBEND	-93.33	-6.30	4.85	.00	.00	.00	.00	284.65	116.74	279.96	303.32
54	SAGBEND	-96.82	-6.42	4.71	.00	.00	.00	.00	284.68	112.99	256.34	280.14
55	SAGBEND	-100.32	-6.53	4.52	.00	.00	.00	.00	284.74	107.75	226.21	250.56
56	SAGBEND	-103.81	-6.61	4.28	.00	.00	.00	.00	284.83	100.71	188.05	213.32
57	SAGBEND	-107.30	-6.67	4.01	.00	.00	.00	.00	284.93	91.52	139.84	167.13
58	SAGBEND	-110.78	-6.71	3.71	.00	.00	.00	.00	285.01	79.70	89.20	119.61
59	SAGBEND	-114.27	-6.74	3.40	.03	-.04	.00	.00	285.06	64.60	43.51	77.89
60	SEABED	-117.75	-6.76	3.07	1.42	-1.42	.00	.00	285.08	45.61	.48	45.61
61	SEABED	-121.24	-6.76	2.75	3.15	-3.15	.00	.00	285.08	26.46	-37.51	45.90
62	SEABED	-124.72	-6.76	2.43	3.60	-3.60	.00	.00	285.06	12.09	-66.60	67.69

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
63	SEABED	-128.21	-6.76	2.13	3.41	-3.41	.00	.00	285.04	3.34	-86.76	86.83
64	SEABED	-131.70	-6.76	1.84	3.01	-3.01	.00	.00	285.02	-.93	-99.77	99.78
65	SEABED	-135.19	-6.76	1.57	2.65	-2.65	.00	.00	285.01	-2.35	-107.74	107.76
66	SEABED	-138.68	-6.76	1.32	2.38	-2.38	.00	.00	285.00	-2.29	-112.38	112.41
67	SEABED	-142.17	-6.76	1.09	2.23	-2.23	.00	.00	284.99	-1.67	-114.90	114.91
68	SEABED	-145.67	-6.76	.89	2.16	-2.16	.00	.00	284.99	-.99	-115.96	115.97
69	SEABED	-149.16	-6.76	.71	2.14	-2.14	.00	.00	284.99	-.47	-115.88	115.88
70	SEABED	-152.66	-6.76	.55	2.14	-2.14	.00	.00	284.99	-.14	-114.73	114.73
71	SEABED	-156.16	-6.76	.41	2.16	-2.16	.00	.00	285.00	.02	-112.41	112.41
72	SEABED	-159.65	-6.76	.30	2.17	-2.17	.00	.00	285.00	.08	-108.76	108.76
73	SEABED	-163.15	-6.76	.20	2.18	-2.18	.00	.00	285.01	.08	-103.53	103.53
74	SEABED	-166.65	-6.76	.13	2.19	-2.19	.00	.00	285.02	.06	-96.39	96.39
75	SEABED	-170.15	-6.76	.07	2.19	-2.19	.00	.00	285.04	.04	-86.93	86.93
76	SEABED	-173.65	-6.76	.04	2.19	-2.19	.00	.00	285.05	.02	-74.61	74.61
77	SEABED	-177.15	-6.76	.01	2.19	-2.00	.00	.00	285.07	.01	-58.73	58.73
78	SEABED	-180.65	-6.76	.00	2.19	-.16	.00	.00	285.08	.00	-39.29	39.29
79	SEABED	-184.15	-6.76	.00	2.19	1.20	.00	.00	285.09	.00	-21.36	21.36
80	SEABED	-187.65	-6.76	-.01	2.19	1.41	.00	.00	285.10	.00	-8.78	8.78
81	SEABED	-191.15	-6.76	.00	2.19	1.11	.00	.00	285.10	.00	-1.60	1.60
82	SEABED	-194.65	-6.76	.00	2.19	.70	.00	.00	285.10	.00	1.59	1.59
83	SEABED	-198.15	-6.76	.00	2.19	.36	.00	.00	285.09	.00	2.40	2.40
84	SEABED	-201.65	-6.76	.00	2.19	.13	.00	.00	285.09	.00	2.07	2.07
85	SEABED	-205.15	-6.76	.00	2.19	.01	.00	.00	285.09	.00	1.39	1.39
86	SEABED	-208.65	-6.76	.00	2.19	-.04	.00	.00	285.09	.00	.76	.76

87	SEABED	-212.15	-6.76	.00	2.19	-.05	.00	.00	285.09	.00	.31	.31
88	SEABED	-215.65	-6.76	.00	2.19	-.04	.00	.00	285.09	.00	.06	.06
89	SEABED	-219.15	-6.76	.00	2.19	-.02	.00	.00	285.09	.00	-.05	.05
90	SEABED	-222.65	-6.76	.00	2.19	-.01	.00	.00	285.09	.00	-.08	.08
91	SEABED	-226.15	-6.76	.00	2.19	.00	.00	.00	285.09	.00	-.07	.07
92	SEABED	-229.65	-6.76	.00	2.19	.00	.00	.00	285.09	.00	-.05	.05
93	SEABED	-233.15	-6.76	.00	2.19	.00	.00	.00	285.09	.00	-.03	.03
94	SEABED	-236.65	-6.76	.00	2.19	.00	.00	.00	285.09	.00	-.01	.01
95	SEABED	-240.15	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
96	SEABED	-243.65	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
97	SEABED	-247.15	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
98	SEABED	-250.65	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
99	SEABED	-254.15	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
100	SEABED	-257.65	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
101	SEABED	-261.15	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
102	SEABED	-264.65	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
103	SEABED	-268.15	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
104	SEABED	-271.65	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
105	SEABED	-275.15	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
106	SEABED	-278.65	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
107	SEABED	-282.15	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
108	SEABED	-285.65	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
109	SEABED	-289.15	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
110	SEABED	-292.65	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
111	SEABED	-296.15	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
112	SEABED	-299.65	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
113	SEABED	-303.15	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
114	SEABED	-306.65	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
115	SEABED	-310.15	-6.76	.00	2.19	.00	.00	.00	285.09	.00	.00	.00
116	SEABED	-313.65	-6.76	.00	.00	.00	.00	.00	285.09	.00	.00	.00

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	BENDING STRESSES HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
1	LAYBARGE	78.48	6.21	.00	.000	.991	.000	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.000	.997	6.361	.00	.00	.00	.00	.00	.00
5	LAYBARGE	65.95	5.99	.00	.000	1.005	12.532	.00	.00	.00	.00	.00	.00
7	LAYBARGE	60.43	5.89	.00	.000	1.004	18.053	.00	.00	.00	.00	.00	.00
9	LAYBARGE	53.79	5.78	.00	.000	1.001	24.694	.00	.00	.00	.00	.00	.00
11	LAYBARGE	47.73	5.67	.00	.000	.875	30.755	.00	.00	.00	.00	.00	.00
13	TENSIONR	38.54	5.55	.00	.026	.967	39.945	.00	.00	.00	.00	.00	.00
15	LAYBARGE	29.53	5.36	.00	-.013	1.140	48.958	.00	.00	.00	.00	.00	.00
17	LAYBARGE	23.33	5.25	.00	.034	1.212	55.159	.00	.00	.00	.00	.00	.00
19	LAYBARGE	17.33	5.11	.00	.167	1.907	61.160	.00	.00	.00	.00	.00	.00
21	LAYBARGE	10.72	4.82	.00	.253	3.361	67.777	.00	.00	.00	.00	.00	.00
24	STINGER	-.89	3.96	.00	.278	5.195	79.419	.00	.00	.00	.00	.00	.00
26	STINGER	-8.31	3.16	.00	.126	6.588	86.882	.00	.00	.00	.00	.00	.00
28	STINGER	-14.42	2.41	.00	-.014	6.974	93.042	.00	.00	.00	.00	.00	.00
30	STINGER	-24.86	1.14	.00	-.014	6.876	103.551	.00	.00	.00	.00	.00	.00
32	STINGER	-30.86	.42	.00	-.011	6.794	109.600	.00	.00	.00	.00	.00	.00
34	STINGER	-36.83	-.29	.00	.075	6.706	115.609	.00	.00	.00	.00	.00	.00
36	STINGER	-41.48	-.83	-.01	-4.720	8.011	120.298	.00	.00	.00	.00	.00	.00
38	SAGBEND	-44.47	-1.18	.49	-9.490	6.470	123.344	.00	.00	.00	.00	.00	.00
39	SAGBEND	-47.41	-1.51	.98	-9.388	6.442	126.344	.00	.00	.00	.00	.00	.00
40	SAGBEND	-50.35	-1.85	1.46	-9.288	6.413	129.344	.00	.00	.00	.00	.00	.00
41	SAGBEND	-53.29	-2.18	1.94	-9.189	6.384	132.345	.00	.00	.00	.00	.00	.00
42	SAGBEND	-56.24	-2.52	2.41	-9.092	6.355	135.345	.00	.00	.00	.00	.00	.00
43	SAGBEND	-59.18	-2.85	2.88	-8.993	6.325	138.345	.00	.00	.00	.00	.00	.00
44	SAGBEND	-62.13	-3.18	3.35	-8.879	6.289	141.345	.00	.00	.00	.00	.00	.00
45	SAGBEND	-65.07	-3.51	3.80	-8.668	6.220	144.345	.00	.00	.00	.00	.00	.00
46	SAGBEND	-68.02	-3.83	4.25	-7.888	5.959	147.345	.00	.00	.00	.00	.00	.00
47	SAGBEND	-70.97	-4.15	4.68	-3.781	4.561	150.345	18.42	-.67	2.03	5.87	24.97	6.96
48	SAGBEND	-73.96	-4.39	4.87	-3.662	4.520	153.345	18.39	-.71	17.57	50.40	72.12	20.09
49	SAGBEND	-76.94	-4.62	5.06	-3.380	4.421	156.345	18.35	-.74	30.19	85.71	109.60	30.53
50	SAGBEND	-79.93	-4.85	5.22	-2.970	4.276	159.345	18.32	-.78	40.41	113.42	139.12	38.75
51	SAGBEND	-82.92	-5.07	5.37	-2.459	4.094	162.345	18.28	-.81	48.67	134.82	162.03	45.13
52	SAGBEND	-85.91	-5.28	5.48	-1.872	3.881	165.345	18.25	-.85	55.28	150.92	179.40	49.97
53	SAGBEND	-88.90	-5.47	5.56	-1.229	3.645	168.345	18.22	-.88	60.50	162.52	192.08	53.50
54	SAGBEND	-91.89	-5.66	5.61	-.546	3.389	171.345	18.20	-.91	64.52	170.21	200.68	55.90
55	SAGBEND	-94.89	-5.83	5.62	.160	3.119	174.345	18.17	-.94	67.49	174.41	205.66	57.29
56	SAGBEND	-97.89	-5.98	5.59	.877	2.839	177.345	18.15	-.96	69.53	175.40	207.32	57.75
57	SAGBEND	-100.88	-6.12	5.53	1.591	2.553	180.345	18.14	-.98	70.70	173.32	205.82	57.33
58	SAGBEND	-103.88	-6.25	5.42	2.291	2.263	183.345	18.12	-1.01	71.05	168.16	201.18	56.04
59	SAGBEND	-106.87	-6.36	5.29	2.962	1.973	186.345	18.11	-1.02	70.57	159.79	193.30	53.84
60	SAGBEND	-109.87	-6.46	5.12	3.593	1.688	189.345	18.11	-1.04	69.24	147.92	181.95	50.68
61	SAGBEND	-112.86	-6.54	4.91	4.166	1.409	192.345	18.10	-1.05	67.02	132.13	166.78	46.46
62	SAGBEND	-115.85	-6.61	4.68	4.667	1.141	195.345	18.10	-1.06	63.81	111.81	147.37	41.05
63	SAGBEND	-118.84	-6.66	4.43	5.073	.889	198.345	18.10	-1.07	59.48	86.17	123.34	34.36

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE	PIPE	X	Y	Z	HORIZ	VERT	PIPE	TENSILE	HOOP	BENDING STRESSES	TOTAL	PERCNT

NO.	SECTION	COORD (M)	COORD (M)	COORD (M)	ANGLE (DEG)	ANGLE (DEG)	LENGTH (M)	STRESS (MPA)	STRESS (MPA)	VERT (MPA)	HORIZ (MPA)	STRESS (MPA)	YIELD (PCT)
64	SAGBEND	-121.82	-6.70	4.15	5.369	.657	201.345	18.10	-1.08	53.86	59.15	98.64	27.48
65	SAGBEND	-124.81	-6.73	3.87	5.560	.451	204.345	18.10	-1.08	46.74	34.61	76.80	21.39
66	SAGBEND	-127.80	-6.75	3.57	5.654	.277	207.345	18.10	-1.08	37.81	11.52	58.17	16.20
67	SEABED	-130.78	-6.76	3.28	5.655	.145	210.345	18.10	-1.09	27.04	-10.72	47.74	13.30
68	SEABED	-133.77	-6.76	2.98	5.570	.056	213.345	18.10	-1.09	16.71	-30.34	53.29	14.84
69	SEABED	-136.75	-6.76	2.70	5.413	.005	216.345	18.10	-1.09	8.68	-45.87	65.33	18.20
70	SEABED	-139.74	-6.76	2.42	5.201	-.019	219.345	18.10	-1.09	3.33	-57.25	76.00	21.17
71	SEABED	-142.73	-6.76	2.15	4.949	-.025	222.345	18.09	-1.09	.27	-65.13	83.77	23.34
72	SEABED	-145.72	-6.76	1.90	4.672	-.023	225.345	18.09	-1.09	-1.15	-70.34	88.99	24.79
73	SEABED	-148.71	-6.76	1.66	4.377	-.017	228.345	18.09	-1.09	-1.55	-73.66	92.32	25.72
74	SEABED	-151.70	-6.76	1.44	4.072	-.011	231.345	18.09	-1.09	-1.41	-75.71	94.36	26.29
75	SEABED	-154.69	-6.76	1.24	3.759	-.006	234.345	18.09	-1.09	-1.05	-76.90	95.55	26.62
76	SEABED	-157.69	-6.76	1.05	3.444	-.003	237.345	18.09	-1.09	-.68	-77.49	96.13	26.78
77	SEABED	-160.68	-6.76	.88	3.127	-.001	240.345	18.09	-1.09	-.38	-77.60	96.24	26.81
78	SEABED	-163.68	-6.76	.72	2.810	.000	243.345	18.09	-1.09	-.16	-77.27	95.91	26.72
79	SEABED	-166.67	-6.76	.58	2.496	.001	246.345	18.09	-1.09	-.03	-76.50	95.15	26.50
80	SEABED	-169.67	-6.76	.46	2.186	.001	249.345	18.09	-1.09	.03	-75.24	93.89	26.15
81	SEABED	-172.67	-6.76	.35	1.882	.001	252.345	18.09	-1.09	.05	-73.42	92.06	25.64
82	SEABED	-175.67	-6.76	.26	1.586	.000	255.345	18.09	-1.09	.05	-70.94	89.58	24.95
83	SEABED	-178.67	-6.76	.19	1.303	.000	258.345	18.09	-1.09	.04	-67.68	86.32	24.04
84	SEABED	-181.67	-6.76	.13	1.034	.000	261.345	18.10	-1.09	.03	-63.49	82.14	22.88
85	SEABED	-184.67	-6.76	.08	.785	.000	264.345	18.10	-1.09	.02	-58.21	76.86	21.41
86	SEABED	-187.67	-6.76	.04	.560	.000	267.345	18.10	-1.09	.01	-51.60	70.25	19.57
87	SEABED	-190.67	-6.76	.02	.366	.000	270.345	18.10	-1.09	.00	-43.39	62.04	17.28
88	SEABED	-193.67	-6.76	.01	.208	.000	273.345	18.10	-1.09	.00	-33.25	51.91	14.46
89	SEABED	-196.67	-6.76	.00	.096	.000	276.345	18.10	-1.09	.00	-22.05	40.70	11.34
90	SEABED	-199.67	-6.76	.00	.026	.000	279.345	18.10	-1.09	.00	-12.49	31.15	8.68
91	SEABED	-202.67	-6.76	-.01	-.010	.000	282.345	18.10	-1.09	.00	-5.67	24.33	6.78
92	SEABED	-205.67	-6.76	.00	-.024	.000	285.345	18.10	-1.09	.00	-1.47	20.14	5.61
93	SEABED	-208.67	-6.76	.00	-.025	.000	288.345	18.10	-1.09	.00	.68	19.35	5.39
94	SEABED	-211.67	-6.76	.00	-.020	.000	291.345	18.10	-1.09	.00	1.49	20.16	5.61
95	SEABED	-214.67	-6.76	.00	-.014	.000	294.345	18.10	-1.09	.00	1.53	20.20	5.63
96	SEABED	-217.67	-6.76	.00	-.008	.000	297.345	18.10	-1.09	.00	1.23	19.90	5.54
97	SEABED	-220.67	-6.76	.00	-.004	.000	300.345	18.10	-1.09	.00	.84	19.51	5.43
98	SEABED	-223.67	-6.76	.00	-.001	.000	303.345	18.10	-1.09	.00	.49	19.16	5.34
99	SEABED	-226.67	-6.76	.00	.000	.000	306.345	18.10	-1.09	.00	.24	18.90	5.27
100	SEABED	-229.67	-6.76	.00	.001	.000	309.345	18.10	-1.09	.00	.08	18.74	5.22
101	SEABED	-232.67	-6.76	.00	.001	.000	312.345	18.10	-1.09	.00	.00	18.67	5.20
102	SEABED	-235.67	-6.76	.00	.001	.000	315.345	18.10	-1.09	.00	-.03	18.70	5.21
103	SEABED	-238.67	-6.76	.00	.001	.000	318.345	18.10	-1.09	.00	-.02	18.69	5.21
104	SEABED	-241.67	-6.76	.00	.001	.000	321.345	18.10	-1.09	.00	.00	18.67	5.20

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
1	LAYBARGE	78.48	6.21	.00	.19	.00	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.38	.00	.00	.00	-.01	.00	.00	.00
5	LAYBARGE	65.95	5.99	.00	.36	.00	.00	.00	-.01	.00	.00	.00
7	LAYBARGE	60.43	5.89	.00	.37	.00	.00	.00	-.02	.00	.00	.00
9	LAYBARGE	53.79	5.78	.00	.39	.00	.00	.00	-.03	.00	.00	.00
11	LAYBARGE	47.73	5.67	.00	.47	.00	.00	.00	-.03	.00	.00	.00
13	TENSIONR	38.54	5.55	.00	1.69	-.14	.00	.00	296.51	.00	.00	.00
15	LAYBARGE	29.53	5.36	.00	.00	.00	.01	.00	296.50	.00	.00	.00
17	LAYBARGE	23.33	5.25	.00	1.58	.00	.00	.00	296.49	.00	.00	.00
19	LAYBARGE	17.33	5.11	.00	6.38	.00	.00	.00	296.46	.00	.00	.00
21	LAYBARGE	10.72	4.82	.00	9.61	.00	.00	.00	296.42	.00	.00	.00
24	STINGER	-.89	3.96	.00	10.50	.00	.00	.00	296.36	.00	.00	.00
26	STINGER	-8.31	3.16	.00	4.91	.00	.00	.00	296.35	.00	.00	.00
28	STINGER	-14.42	2.41	.00	.00	.00	.03	.00	296.32	.00	.00	.00
30	STINGER	-24.86	1.14	.00	.00	.00	.40	.00	296.24	.00	.00	.00
32	STINGER	-30.86	.42	.00	.00	-.24	.78	.00	296.20	.00	.00	.00
34	STINGER	-36.83	-.29	.00	.00	.27	1.32	.00	296.15	.00	.00	.00
36	STINGER	-41.48	-.83	-.01	-.94	-51.16	1.80	.00	294.95	.00	.00	.00
38	SAGBEND	-44.47	-1.18	.49	.00	.00	.00	.00	296.09	.00	.00	.00
39	SAGBEND	-47.41	-1.51	.98	.00	.00	.00	.00	296.07	.00	.00	.00
40	SAGBEND	-50.35	-1.85	1.46	.00	.00	.00	.00	296.05	.00	.00	.00
41	SAGBEND	-53.29	-2.18	1.94	.00	.00	.00	.00	296.04	.00	.00	.00
42	SAGBEND	-56.24	-2.52	2.41	.00	.00	.00	.00	296.02	.00	.00	.00
43	SAGBEND	-59.18	-2.85	2.88	.00	.00	.00	.00	296.00	.00	.01	.00
44	SAGBEND	-62.13	-3.18	3.35	.00	.00	.00	.00	295.98	.01	.04	.00
45	SAGBEND	-65.07	-3.51	3.80	.00	.00	.00	.00	295.96	.09	.26	.00
46	SAGBEND	-68.02	-3.83	4.25	.00	.00	.00	.00	295.91	.51	1.51	.00
47	SAGBEND	-70.97	-4.15	4.68	.00	.00	.00	.00	294.75	3.04	8.80	9.31
48	SAGBEND	-73.96	-4.39	4.87	.00	.00	.00	.00	294.55	26.34	75.57	80.03
49	SAGBEND	-76.94	-4.62	5.06	.00	.00	.00	.00	294.31	45.26	128.51	136.25
50	SAGBEND	-79.93	-4.85	5.22	.00	.00	.00	.00	294.06	60.59	170.05	180.53
51	SAGBEND	-82.92	-5.07	5.37	.00	.00	.00	.00	293.81	72.97	202.13	214.90
52	SAGBEND	-85.91	-5.28	5.48	.00	.00	.00	.00	293.59	82.88	226.27	240.97
53	SAGBEND	-88.90	-5.47	5.56	.00	.00	.00	.00	293.39	90.70	243.66	259.99
54	SAGBEND	-91.89	-5.66	5.61	.00	.00	.00	.00	293.22	96.73	255.19	272.91
55	SAGBEND	-94.89	-5.83	5.62	.00	.00	.00	.00	293.08	101.19	261.49	280.39
56	SAGBEND	-97.89	-5.98	5.59	.00	.00	.00	.00	292.97	104.25	262.98	282.89
57	SAGBEND	-100.88	-6.12	5.53	.00	.00	.00	.00	292.89	106.01	259.86	280.65
58	SAGBEND	-103.88	-6.25	5.42	.00	.00	.00	.00	292.84	106.52	252.12	273.70
59	SAGBEND	-106.87	-6.36	5.29	.00	.00	.00	.00	292.83	105.80	239.57	261.89
60	SAGBEND	-109.87	-6.46	5.12	.00	.00	.00	.00	292.83	103.82	221.77	244.87
61	SAGBEND	-112.86	-6.54	4.91	.00	.00	.00	.00	292.87	100.48	198.10	222.13
62	SAGBEND	-115.85	-6.61	4.68	.00	.00	.00	.00	292.92	95.67	167.64	193.02
63	SAGBEND	-118.84	-6.66	4.43	.00	.00	.00	.00	292.99	89.17	129.20	156.98

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE	PIPE	X	Y	Z	SUPPORT REACTION	SUPT SEPARATIONS	PIPE	BENDING MOMENTS

NO.	SECTION	COORD (M)	COORD (M)	COORD (M)	VERT (KN)	HORIZ (KN)	VERT (M)	HORIZ (M)	TENSION (KN)	VERT (KN-M)	HORIZ (KN-M)	TOTAL (KN-M)
64	SAGBEND	-121.82	-6.70	4.15	.00	.00	.00	.00	293.04	80.76	88.68	119.94
65	SAGBEND	-124.81	-6.73	3.87	.00	.00	.00	.00	293.08	70.07	51.89	87.19
66	SAGBEND	-127.80	-6.75	3.57	.13	-.14	.00	.00	293.10	56.69	17.28	59.26
67	SEABED	-130.78	-6.76	3.28	1.54	-1.55	.00	.00	293.11	40.54	-16.07	43.61
68	SEABED	-133.77	-6.76	2.98	2.69	-2.69	.00	.00	293.10	25.05	-45.49	51.93
69	SEABED	-136.75	-6.76	2.70	3.03	-3.03	.00	.00	293.09	13.02	-68.77	69.99
70	SEABED	-139.74	-6.76	2.42	2.95	-2.95	.00	.00	293.07	5.00	-85.84	85.99
71	SEABED	-142.73	-6.76	2.15	2.69	-2.69	.00	.00	293.05	.40	-97.65	97.65
72	SEABED	-145.72	-6.76	1.90	2.41	-2.41	.00	.00	293.04	-1.73	-105.46	105.47
73	SEABED	-148.71	-6.76	1.66	2.17	-2.17	.00	.00	293.03	-2.32	-110.44	110.47
74	SEABED	-151.70	-6.76	1.44	2.01	-2.01	.00	.00	293.02	-2.11	-113.51	113.53
75	SEABED	-154.69	-6.76	1.24	1.91	-1.91	.00	.00	293.02	-1.58	-115.30	115.31
76	SEABED	-157.69	-6.76	1.05	1.86	-1.86	.00	.00	293.02	-1.02	-116.17	116.18
77	SEABED	-160.68	-6.76	.88	1.84	-1.84	.00	.00	293.02	-.56	-116.34	116.34
78	SEABED	-163.68	-6.76	.72	1.84	-1.84	.00	.00	293.02	-.24	-115.85	115.85
79	SEABED	-166.67	-6.76	.58	1.84	-1.84	.00	.00	293.02	-.05	-114.70	114.70
80	SEABED	-169.67	-6.76	.46	1.85	-1.85	.00	.00	293.02	.04	-112.81	112.81
81	SEABED	-172.67	-6.76	.35	1.86	-1.86	.00	.00	293.03	.08	-110.08	110.08
82	SEABED	-175.67	-6.76	.26	1.87	-1.87	.00	.00	293.03	.08	-106.35	106.35
83	SEABED	-178.67	-6.76	.19	1.87	-1.87	.00	.00	293.04	.06	-101.47	101.47
84	SEABED	-181.67	-6.76	.13	1.88	-1.88	.00	.00	293.05	.04	-95.20	95.20
85	SEABED	-184.67	-6.76	.08	1.88	-1.88	.00	.00	293.07	.02	-87.27	87.27
86	SEABED	-187.67	-6.76	.04	1.88	-1.88	.00	.00	293.09	.01	-77.37	77.37
87	SEABED	-190.67	-6.76	.02	1.88	-1.87	.00	.00	293.11	.00	-65.06	65.06
88	SEABED	-193.67	-6.76	.01	1.88	-1.25	.00	.00	293.12	.00	-49.86	49.86
89	SEABED	-196.67	-6.76	.00	1.88	.38	.00	.00	293.12	.00	-33.05	33.05
90	SEABED	-199.67	-6.76	.00	1.88	1.11	.00	.00	293.12	.00	-18.73	18.73
91	SEABED	-202.67	-6.76	-.01	1.88	1.20	.00	.00	293.12	.00	-8.50	8.50
92	SEABED	-205.67	-6.76	.00	1.88	.99	.00	.00	293.12	.00	-2.21	2.21
93	SEABED	-208.67	-6.76	.00	1.88	.69	.00	.00	293.12	.00	1.02	1.02
94	SEABED	-211.67	-6.76	.00	1.88	.41	.00	.00	293.12	.00	2.24	2.24
95	SEABED	-214.67	-6.76	.00	1.88	.20	.00	.00	293.12	.00	2.30	2.30
96	SEABED	-217.67	-6.76	.00	1.88	.07	.00	.00	293.12	.00	1.85	1.85
97	SEABED	-220.67	-6.76	.00	1.88	.00	.00	.00	293.12	.00	1.26	1.26
98	SEABED	-223.67	-6.76	.00	1.88	-.04	.00	.00	293.12	.00	.74	.74
99	SEABED	-226.67	-6.76	.00	1.88	-.04	.00	.00	293.12	.00	.36	.36
100	SEABED	-229.67	-6.76	.00	1.88	-.04	.00	.00	293.12	.00	.12	.12
101	SEABED	-232.67	-6.76	.00	1.88	-.03	.00	.00	293.12	.00	-.01	.01
102	SEABED	-235.67	-6.76	.00	1.88	-.02	.00	.00	293.12	.00	-.04	.04
103	SEABED	-238.67	-6.76	.00	1.88	-.01	.00	.00	293.12	.00	-.03	.03
104	SEABED	-241.67	-6.76	.00	.00	.00	.00	.00	293.12	.00	.00	.00

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	BENDING STRESSES HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
1	LAYBARGE	78.48	6.21	.00	.000	.991	.000	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.000	.997	6.361	.00	.00	.00	.00	.00	.00
5	LAYBARGE	65.95	5.99	.00	.000	1.005	12.532	.00	.00	.00	.00	.00	.00
7	LAYBARGE	60.43	5.89	.00	.000	1.004	18.053	.00	.00	.00	.00	.00	.00
9	LAYBARGE	53.79	5.78	.00	.000	1.001	24.694	.00	.00	.00	.00	.00	.00
11	LAYBARGE	47.73	5.67	.00	.000	.875	30.755	.00	.00	.00	.00	.00	.00
13	TENSIONR	38.54	5.55	.00	.000	.967	39.945	.00	.00	.00	.00	.00	.00
15	LAYBARGE	29.53	5.36	.00	.000	1.140	48.958	.00	.00	.00	.00	.00	.00
17	LAYBARGE	23.33	5.25	.00	.000	1.212	55.159	.00	.00	.00	.00	.00	.00
19	LAYBARGE	17.33	5.11	.00	.000	1.907	61.160	.00	.00	.00	.00	.00	.00
21	LAYBARGE	10.72	4.82	.00	.000	3.361	67.777	.00	.00	.00	.00	.00	.00
24	STINGER	-.89	3.96	.00	.000	5.056	79.419	.00	.00	.00	.00	.00	.00
26	STINGER	-8.31	3.20	.00	.000	5.835	86.882	.00	.00	.00	.00	.00	.00
28	STINGER	-14.44	2.57	.00	.000	5.745	93.042	.00	.00	.00	.00	.00	.00
30	STINGER	-24.90	1.53	.00	.000	5.647	103.550	.00	.00	.00	.00	.00	.00
32	STINGER	-30.87	.95	.00	-.002	5.562	109.549	.00	.00	.00	.00	.00	.00
34	STINGER	-36.84	.37	.00	.111	5.495	115.544	.00	.00	.00	.00	.00	.00
36	STINGER	-41.47	-.07	-.02	-2.991	5.411	120.204	.00	.00	.00	.00	.00	.00
38	SAGBEND	-45.07	-.41	.37	-6.142	5.325	123.842	.00	.00	.00	.00	.00	.00
39	SAGBEND	-48.54	-.74	.74	-6.016	5.290	127.342	.00	.00	.00	.00	.00	.00
40	SAGBEND	-52.01	-1.06	1.10	-5.892	5.255	130.842	.00	.00	.00	.00	.00	.00
41	SAGBEND	-55.47	-1.38	1.46	-5.770	5.220	134.342	.00	.00	.00	.00	.00	.00
42	SAGBEND	-58.94	-1.70	1.81	-5.650	5.185	137.842	.00	.00	.00	.00	.00	.00
43	SAGBEND	-62.41	-2.01	2.14	-5.531	5.150	141.342	.00	.00	.00	.00	.00	.00
44	SAGBEND	-65.88	-2.32	2.48	-5.415	5.115	144.842	.00	.00	.00	.00	.00	.00
45	SAGBEND	-69.35	-2.64	2.80	-5.300	5.080	148.342	.00	.00	.00	.00	.00	.00
46	SAGBEND	-72.82	-2.94	3.12	-5.186	5.044	151.842	.00	.00	.00	.00	.00	.00
47	SAGBEND	-76.30	-3.25	3.43	-5.075	5.009	155.342	.00	.00	.00	.00	.00	.00
48	SAGBEND	-79.77	-3.56	3.74	-4.965	4.974	158.842	.00	.00	.00	.00	.00	.00
49	SAGBEND	-83.24	-3.86	4.04	-4.856	4.938	162.342	.00	.00	.00	.00	.00	.00
50	SAGBEND	-86.72	-4.16	4.33	-4.747	4.902	165.842	.00	.00	.00	.00	.00	.00
51	SAGBEND	-90.19	-4.46	4.61	-4.624	4.860	169.342	.00	.00	.00	.00	.00	.00
52	SAGBEND	-93.67	-4.75	4.89	-4.415	4.785	172.842	.00	.00	.00	.00	.00	.00
53	SAGBEND	-97.15	-5.04	5.16	-3.696	4.518	176.342	.00	.00	.00	.00	.00	.00
54	SAGBEND	-100.63	-5.33	5.40	.001	3.124	179.842	18.19	-.86	2.32	6.10	25.15	7.01
55	SAGBEND	-104.12	-5.51	5.40	.143	3.069	183.342	18.16	-.89	19.72	51.12	73.40	20.45
56	SAGBEND	-107.62	-5.70	5.38	.471	2.942	186.842	18.13	-.92	33.14	84.46	109.32	30.45
57	SAGBEND	-111.11	-5.87	5.34	.934	2.759	190.342	18.10	-.94	43.34	108.15	135.08	37.63
58	SAGBEND	-112.87	-5.96	5.31	1.204	2.650	192.103	18.09	-.96	47.45	116.90	144.73	40.31
59	SAGBEND	-115.49	-6.07	5.24	1.640	2.471	194.723	18.07	-.98	52.43	126.41	155.42	43.29
60	SAGBEND	-118.10	-6.18	5.16	2.103	2.277	197.342	18.06	-.99	56.22	132.04	162.07	45.14
61	SAGBEND	-121.60	-6.31	5.01	2.740	2.000	200.842	18.04	-1.02	59.59	133.89	165.10	45.99
62	SAGBEND	-125.09	-6.43	4.82	3.370	1.712	204.342	18.03	-1.03	61.18	129.41	161.69	45.04
63	SAGBEND	-128.58	-6.52	4.60	3.964	1.420	207.842	18.02	-1.05	61.08	118.46	151.83	42.29

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE	PIPE	X	Y	Z	HORIZ	VERT	PIPE	TENSILE	HOOP	BENDING STRESSES	TOTAL	PERCNT

NO.	SECTION	COORD (M)	COORD (M)	COORD (M)	ANGLE (DEG)	ANGLE (DEG)	LENGTH (M)	STRESS (MPA)	STRESS (MPA)	VERT (MPA)	HORIZ (MPA)	STRESS (MPA)	YIELD (PCT)
64	SAGBEND	-132.07	-6.60	4.34	4.489	1.132	211.342	18.01	-1.06	59.29	100.51	135.24	37.67
65	SAGBEND	-135.56	-6.66	4.05	4.910	.857	214.842	18.01	-1.07	55.71	74.62	111.67	31.11
66	SAGBEND	-139.05	-6.70	3.74	5.196	.604	218.342	18.01	-1.08	50.15	46.15	86.71	24.15
67	SAGBEND	-142.53	-6.73	3.42	5.354	.383	221.842	18.01	-1.08	42.31	20.32	65.49	18.24
68	SEABED	-146.02	-6.75	3.09	5.392	.205	225.342	18.01	-1.09	31.75	-4.35	50.60	14.10
69	SEABED	-149.50	-6.76	2.77	5.315	.083	228.842	18.01	-1.09	19.71	-27.41	52.32	14.57
70	SEABED	-152.99	-6.76	2.45	5.138	.014	232.342	18.01	-1.09	9.88	-45.82	65.43	18.23
71	SEABED	-156.47	-6.76	2.14	4.886	-.017	235.842	18.01	-1.09	3.48	-58.86	77.51	21.59
72	SEABED	-159.96	-6.76	1.85	4.584	-.024	239.342	18.00	-1.09	.08	-67.30	85.86	23.92
73	SEABED	-163.45	-6.76	1.58	4.250	-.021	242.842	18.00	-1.09	-1.26	-72.40	90.96	25.34
74	SEABED	-166.94	-6.76	1.33	3.897	-.014	246.342	18.00	-1.09	-1.45	-75.26	93.83	26.14
75	SEABED	-170.43	-6.76	1.11	3.534	-.008	249.842	18.00	-1.09	-1.15	-76.70	95.26	26.53
76	SEABED	-173.93	-6.76	.90	3.167	-.003	253.342	18.00	-1.09	-.73	-77.19	95.74	26.67
77	SEABED	-177.42	-6.76	.72	2.799	-.001	256.842	18.00	-1.09	-.38	-76.96	95.51	26.60
78	SEABED	-180.92	-6.76	.56	2.434	.001	260.342	18.00	-1.09	-.14	-76.08	94.63	26.36
79	SEABED	-184.42	-6.76	.42	2.075	.001	263.842	18.00	-1.09	-.01	-74.49	93.04	25.92
80	SEABED	-187.91	-6.76	.31	1.725	.001	267.342	18.00	-1.09	.04	-72.09	90.64	25.25
81	SEABED	-191.41	-6.76	.21	1.389	.001	270.842	18.00	-1.09	.05	-68.70	87.25	24.30
82	SEABED	-194.91	-6.76	.14	1.072	.000	274.342	18.00	-1.09	.04	-64.12	82.67	23.03
83	SEABED	-198.41	-6.76	.08	.780	.000	277.842	18.01	-1.09	.03	-58.06	76.61	21.34
84	SEABED	-201.91	-6.76	.04	.521	.000	281.342	18.01	-1.09	.01	-50.17	68.73	19.14
85	SEABED	-205.41	-6.76	.01	.305	.000	284.842	18.01	-1.09	.01	-40.01	58.57	16.31
86	SEABED	-208.91	-6.76	.00	.144	.000	288.342	18.01	-1.09	.00	-27.33	45.89	12.78
87	SEABED	-212.41	-6.76	.00	.044	.000	291.842	18.01	-1.09	.00	-15.21	33.77	9.41
88	SEABED	-215.91	-6.76	-.01	-.007	.000	295.342	18.01	-1.09	.00	-6.50	25.07	6.98
89	SEABED	-219.41	-6.76	.00	-.024	.000	298.842	18.01	-1.09	.00	-1.42	19.99	5.57
90	SEABED	-222.91	-6.76	.00	-.024	.000	302.342	18.01	-1.09	.00	.91	19.49	5.43
91	SEABED	-226.41	-6.76	.00	-.018	.000	305.842	18.01	-1.09	.00	1.57	20.14	5.61
92	SEABED	-229.91	-6.76	.00	-.011	.000	309.342	18.01	-1.09	.00	1.40	19.98	5.56
93	SEABED	-233.41	-6.76	.00	-.005	.000	312.842	18.01	-1.09	.00	.96	19.54	5.44
94	SEABED	-236.91	-6.76	.00	-.002	.000	316.342	18.01	-1.09	.00	.54	19.12	5.32
95	SEABED	-240.41	-6.76	.00	.000	.000	319.842	18.01	-1.09	.00	.23	18.81	5.24
96	SEABED	-243.91	-6.76	.00	.001	.000	323.342	18.01	-1.09	.00	.05	18.63	5.19
97	SEABED	-247.41	-6.76	.00	.001	.000	326.842	18.01	-1.09	.00	-.03	18.61	5.18
98	SEABED	-250.91	-6.76	.00	.001	.000	330.342	18.01	-1.09	.00	-.05	18.63	5.19
99	SEABED	-254.41	-6.76	.00	.000	.000	333.842	18.01	-1.09	.00	-.05	18.63	5.19
100	SEABED	-257.91	-6.76	.00	.000	.000	337.342	18.01	-1.09	.00	-.03	18.61	5.18
101	SEABED	-261.41	-6.76	.00	.000	.000	340.842	18.01	-1.09	.00	-.02	18.60	5.18
102	SEABED	-264.91	-6.76	.00	.000	.000	344.342	18.01	-1.09	.00	-.01	18.58	5.18
103	SEABED	-268.41	-6.76	.00	.000	.000	347.842	18.01	-1.09	.00	.00	18.58	5.18
104	SEABED	-271.91	-6.76	.00	.000	.000	351.342	18.01	-1.09	.00	.00	18.58	5.17
105	SEABED	-275.41	-6.76	.00	.000	.000	354.842	18.01	-1.09	.00	.00	18.58	5.18
106	SEABED	-278.91	-6.76	.00	.000	.000	358.342	18.01	-1.09	.00	.00	18.58	5.18
107	SEABED	-282.41	-6.76	.00	.000	.000	361.842	18.01	-1.09	.00	.00	18.58	5.17
108	SEABED	-285.91	-6.76	.00	.000	.000	365.342	18.01	-1.09	.00	.00	18.58	5.17

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	HORIZ ANGLE (DEG)	VERT ANGLE (DEG)	PIPE LENGTH (M)	TENSILE STRESS (MPA)	HOOP STRESS (MPA)	BENDING STRESSES VERT (MPA)	BENDING STRESSES HORIZ (MPA)	TOTAL STRESS (MPA)	PERCNT YIELD (PCT)
109	SEABED	-289.41	-6.76	.00	.000	.000	368.842	18.01	-1.09	.00	.00	18.58	5.17
110	SEABED	-292.91	-6.76	.00	.000	.000	372.342	18.01	-1.09	.00	.00	18.58	5.17
111	SEABED	-296.41	-6.76	.00	.000	.000	375.842	18.01	-1.09	.00	.00	18.58	5.17
112	SEABED	-299.91	-6.76	.00	.000	.000	379.342	18.01	-1.09	.00	.00	18.58	5.17
113	SEABED	-303.41	-6.76	.00	.000	.000	382.842	18.01	-1.09	.00	.00	18.58	5.17
114	SEABED	-306.91	-6.76	.00	.000	.000	386.342	18.01	-1.09	.00	.00	18.58	5.17
115	SEABED	-310.41	-6.76	.00	.000	.000	389.842	18.01	-1.09	.00	.00	18.58	5.17
116	SEABED	-313.91	-6.76	.00	.000	.000	393.342	18.01	-1.09	.00	.00	18.58	5.17

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
1	LAYBARGE	78.48	6.21	.00	.19	.00	.00	.00	.00	.00	.00	.00
3	LAYBARGE	72.12	6.10	.00	.38	.00	.00	.00	-.01	.00	.00	.00
5	LAYBARGE	65.95	5.99	.00	.36	.00	.00	.00	-.01	.00	.00	.00
7	LAYBARGE	60.43	5.89	.00	.37	.00	.00	.00	-.02	.00	.00	.00
9	LAYBARGE	53.79	5.78	.00	.39	.00	.00	.00	-.03	.00	.00	.00
11	LAYBARGE	47.73	5.67	.00	.47	.00	.00	.00	-.03	.00	.00	.00
13	TENSIONR	38.54	5.55	.00	1.68	.00	.00	.00	294.16	.00	.00	.00
15	LAYBARGE	29.53	5.36	.00	.00	.00	.01	.00	294.16	.00	.00	.00
17	LAYBARGE	23.33	5.25	.00	1.57	.00	.00	.00	294.15	.00	.00	.00
19	LAYBARGE	17.33	5.11	.00	6.33	.00	.00	.00	294.12	.00	.00	.00
21	LAYBARGE	10.72	4.82	.00	9.54	.00	.00	.00	294.08	.00	.00	.00
24	STINGER	-.89	3.96	.00	8.99	.00	.00	.00	294.04	.00	.00	.00
26	STINGER	-8.31	3.20	.00	.00	.00	.04	.00	294.02	.00	.00	.00
28	STINGER	-14.44	2.57	.00	.00	.00	.20	.00	293.99	.00	.00	.00
30	STINGER	-24.90	1.53	.00	.00	.00	.80	.00	293.92	.00	.00	.00
32	STINGER	-30.87	.95	.00	.00	-.02	1.31	.00	293.89	.00	.00	.00
34	STINGER	-36.84	.37	.00	.00	1.11	1.98	.00	293.85	.00	.00	.00
36	STINGER	-41.47	-.07	-.02	-.39	-33.25	2.57	.00	293.36	.00	.00	.00
38	SAGBEND	-45.07	-.41	.37	.00	.00	.00	.00	293.82	.00	.00	.00
39	SAGBEND	-48.54	-.74	.74	.00	.00	.00	.00	293.80	.00	.00	.00
40	SAGBEND	-52.01	-1.06	1.10	.00	.00	.00	.00	293.79	.00	.00	.00
41	SAGBEND	-55.47	-1.38	1.46	.00	.00	.00	.00	293.77	.00	.00	.00
42	SAGBEND	-58.94	-1.70	1.81	.00	.00	.00	.00	293.75	.00	.00	.00
43	SAGBEND	-62.41	-2.01	2.14	.00	.00	.00	.00	293.74	.00	.00	.00
44	SAGBEND	-65.88	-2.32	2.48	.00	.00	.00	.00	293.72	.00	.00	.00
45	SAGBEND	-69.35	-2.64	2.80	.00	.00	.00	.00	293.70	.00	.00	.00
46	SAGBEND	-72.82	-2.94	3.12	.00	.00	.00	.00	293.69	.00	.00	.00
47	SAGBEND	-76.30	-3.25	3.43	.00	.00	.00	.00	293.67	.00	.00	.00
48	SAGBEND	-79.77	-3.56	3.74	.00	.00	.00	.00	293.65	.00	.00	.00

49	SAGBEND	-83.24	-3.86	4.04	.00	.00	.00	.00	293.64	.00	.00	.00
50	SAGBEND	-86.72	-4.16	4.33	.00	.00	.00	.00	293.62	.00	.01	.00
51	SAGBEND	-90.19	-4.46	4.61	.00	.00	.00	.00	293.61	.02	.05	.00
52	SAGBEND	-93.67	-4.75	4.89	.00	.00	.00	.00	293.59	.10	.27	.00
53	SAGBEND	-97.15	-5.04	5.16	.00	.00	.00	.00	293.55	.59	1.57	.00
54	SAGBEND	-100.63	-5.33	5.40	.00	.00	.00	.00	292.60	3.48	9.14	9.78
55	SAGBEND	-104.12	-5.51	5.40	.00	.00	.00	.00	292.43	29.57	76.65	82.15
56	SAGBEND	-107.62	-5.70	5.38	.00	.00	.00	.00	292.22	49.69	126.62	136.02
57	SAGBEND	-111.11	-5.87	5.34	.00	.00	.00	.00	292.01	64.97	162.14	174.68
58	SAGBEND	-112.87	-5.96	5.31	.00	.00	.00	.00	291.92	71.13	175.26	189.15
59	SAGBEND	-115.49	-6.07	5.24	.00	.00	.00	.00	291.80	78.61	189.53	205.19
60	SAGBEND	-118.10	-6.18	5.16	.00	.00	.00	.00	291.70	84.29	197.97	215.17
61	SAGBEND	-121.60	-6.31	5.01	.00	.00	.00	.00	291.60	89.34	200.74	219.72
62	SAGBEND	-125.09	-6.43	4.82	.00	.00	.00	.00	291.54	91.73	194.02	214.61
63	SAGBEND	-128.58	-6.52	4.60	.00	.00	.00	.00	291.53	91.58	177.61	199.83

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
64	SAGBEND	-132.07	-6.60	4.34	.00	.00	.00	.00	291.56	88.90	150.70	174.96
65	SAGBEND	-135.56	-6.66	4.05	.00	.00	.00	.00	291.61	83.52	111.87	139.61
66	SAGBEND	-139.05	-6.70	3.74	.00	.00	.00	.00	291.65	75.19	69.20	102.18
67	SAGBEND	-142.53	-6.73	3.42	.00	.00	.00	.00	291.68	63.43	30.46	70.36
68	SEABED	-146.02	-6.75	3.09	.75	-.75	.00	.00	291.69	47.60	-6.52	48.04
69	SEABED	-149.50	-6.76	2.77	2.68	-2.68	.00	.00	291.68	29.55	-41.10	50.62
70	SEABED	-152.99	-6.76	2.45	3.42	-3.42	.00	.00	291.67	14.82	-68.70	70.28
71	SEABED	-156.47	-6.76	2.14	3.39	-3.39	.00	.00	291.64	5.22	-88.24	88.40
72	SEABED	-159.96	-6.76	1.85	3.06	-3.06	.00	.00	291.62	.12	-100.91	100.91
73	SEABED	-163.45	-6.76	1.58	2.71	-2.71	.00	.00	291.61	-1.89	-108.55	108.56
74	SEABED	-166.94	-6.76	1.33	2.43	-2.43	.00	.00	291.60	-2.18	-112.84	112.86
75	SEABED	-170.43	-6.76	1.11	2.26	-2.26	.00	.00	291.60	-1.72	-114.99	115.01
76	SEABED	-173.93	-6.76	.90	2.18	-2.18	.00	.00	291.60	-1.10	-115.72	115.73
77	SEABED	-177.42	-6.76	.72	2.15	-2.15	.00	.00	291.60	-.57	-115.38	115.39
78	SEABED	-180.92	-6.76	.56	2.15	-2.15	.00	.00	291.60	-.21	-114.06	114.06
79	SEABED	-184.42	-6.76	.42	2.16	-2.16	.00	.00	291.61	-.02	-111.68	111.68
80	SEABED	-187.91	-6.76	.31	2.17	-2.17	.00	.00	291.61	.06	-108.08	108.08
81	SEABED	-191.41	-6.76	.21	2.18	-2.18	.00	.00	291.62	.08	-103.00	103.00
82	SEABED	-194.91	-6.76	.14	2.18	-2.18	.00	.00	291.63	.06	-96.13	96.13
83	SEABED	-198.41	-6.76	.08	2.19	-2.19	.00	.00	291.64	.04	-87.05	87.05
84	SEABED	-201.91	-6.76	.04	2.19	-2.19	.00	.00	291.66	.02	-75.22	75.22
85	SEABED	-205.41	-6.76	.01	2.19	-2.09	.00	.00	291.68	.01	-59.98	59.98
86	SEABED	-208.91	-6.76	.00	2.19	-.41	.00	.00	291.69	.00	-40.98	40.98
87	SEABED	-212.41	-6.76	.00	2.19	1.11	.00	.00	291.70	.00	-22.80	22.80
88	SEABED	-215.91	-6.76	-.01	2.19	1.40	.00	.00	291.70	.00	-9.74	9.74
89	SEABED	-219.41	-6.76	.00	2.19	1.14	.00	.00	291.70	.00	-2.12	2.12
90	SEABED	-222.91	-6.76	.00	2.19	.74	.00	.00	291.70	.00	1.37	1.37
91	SEABED	-226.41	-6.76	.00	2.19	.39	.00	.00	291.70	.00	2.35	2.35
92	SEABED	-229.91	-6.76	.00	2.19	.15	.00	.00	291.70	.00	2.10	2.10
93	SEABED	-233.41	-6.76	.00	2.19	.02	.00	.00	291.70	.00	1.45	1.45
94	SEABED	-236.91	-6.76	.00	2.19	-.04	.00	.00	291.70	.00	.81	.81
95	SEABED	-240.41	-6.76	.00	2.19	-.05	.00	.00	291.70	.00	.35	.35
96	SEABED	-243.91	-6.76	.00	2.19	-.04	.00	.00	291.70	.00	.08	.08
97	SEABED	-247.41	-6.76	.00	2.19	-.03	.00	.00	291.70	.00	-.05	.05
98	SEABED	-250.91	-6.76	.00	2.19	-.01	.00	.00	291.70	.00	-.08	.08
99	SEABED	-254.41	-6.76	.00	2.19	-.01	.00	.00	291.70	.00	-.07	.07
100	SEABED	-257.91	-6.76	.00	2.19	.00	.00	.00	291.70	.00	-.05	.05
101	SEABED	-261.41	-6.76	.00	2.19	.00	.00	.00	291.70	.00	-.03	.03
102	SEABED	-264.91	-6.76	.00	2.19	.00	.00	.00	291.70	.00	-.01	.01
103	SEABED	-268.41	-6.76	.00	2.19	.00	.00	.00	291.70	.00	.00	.00
104	SEABED	-271.91	-6.76	.00	2.19	.00	.00	.00	291.70	.00	.00	.00
105	SEABED	-275.41	-6.76	.00	2.19	.00	.00	.00	291.70	.00	.00	.00
106	SEABED	-278.91	-6.76	.00	2.19	.00	.00	.00	291.70	.00	.00	.00
107	SEABED	-282.41	-6.76	.00	2.19	.00	.00	.00	291.70	.00	.00	.00
108	SEABED	-285.91	-6.76	.00	2.19	.00	.00	.00	291.70	.00	.00	.00

S T A T I C P I P E C O O R D I N A T E S, F O R C E S A N D S T R E S S E S

NODE NO.	PIPE SECTION	X COORD (M)	Y COORD (M)	Z COORD (M)	SUPPORT REACTION VERT (KN)	SUPPORT REACTION HORIZ (KN)	SUPT SEPARATIONS VERT (M)	SUPT SEPARATIONS HORIZ (M)	PIPE TENSION (KN)	BENDING MOMENTS VERT (KN-M)	BENDING MOMENTS HORIZ (KN-M)	BENDING MOMENTS TOTAL (KN-M)
109	SEABED	-289.41	-6.76	.00	2.19	.00	.00	.00	291.70	.00	.00	.00
110	SEABED	-292.91	-6.76	.00	2.19	.00	.00	.00	291.70	.00	.00	.00
111	SEABED	-296.41	-6.76	.00	2.19	.00	.00	.00	291.70	.00	.00	.00
112	SEABED	-299.91	-6.76	.00	2.19	.00	.00	.00	291.70	.00	.00	.00
113	SEABED	-303.41	-6.76	.00	2.19	.00	.00	.00	291.70	.00	.00	.00
114	SEABED	-306.91	-6.76	.00	2.19	.00	.00	.00	291.70	.00	.00	.00
115	SEABED	-310.41	-6.76	.00	2.19	.00	.00	.00	291.70	.00	.00	.00
116	SEABED	-313.91	-6.76	.00	.00	.00	.00	.00	291.70	.00	.00	.00

BIODATA PENULIS

Maryanto Satrio Pasengo' dilahirkan di Polewali, Sulawesi Barat pada tanggal 1 Oktober 1993 dari pasangan Bapak Yulius Pasengo' dan Ibu Netty Herawati. Penulis merupakan anak kedua dari dua bersaudara. Pendidikan formal yang pernah ditempuh penulis dimulai dari TK Bhayangkari Polewali, SDN 001 Polewali, SMPN 3 Polewali, SMA Kristen Barana' Toraja Utara, dan terakhir di Institut Teknologi Sepuluh Nopember pada Jurusan Teknik Kelautan Fakultas Teknologi Kelautan. Selama masa perkuliahan, penulis cukup aktif mengikuti seminar dan kuliah tamu. Penulis sempat menempuh 2 bulan (Juli-Agustus 2014) Kerja Praktek di PT. Rekayasa Industri, Jakarta Selatan. Penulis tertarik dengan pada bidang pipeline baik meliputi desain sebelum dan sesudah instalasi. Oleh karena itu, penulis mengambil "ANALISA *ABANDONMENT AND RECOVERY* SEBAGAI MITIGASI CUACA BURUK PADA PROSES INSTALASI PIPA BAWAH LAUT" sebagai judul tugas akhir.